SEQUENCE LISTING

<110> UNO, Yumiko
      HIKICHI, Yukiko
      SAGIYA, Yoji
      NAKANISHI, Atsushi

<120> Novel Protein and its DNA

<130> 3015US0P

<140> US 10/501,566
<141> 2004-07-15

<150> PCT/JP03/00311
<151> 2003-01-16

<150> JP 2002-10840
<151> 2002-01-18

<150> JP 2002-15995
<151> 2002-01-24

<150> JP 2002-25662
<151> 2002-02-01

<150> JP 2002-25706
<151> 2002-02-01

<150> JP 2002-30015
<151> 2002-02-06

<150> JP 2002-33111
<151> 2002-02-08

<150> JP 2002-45058
<151> 2002-02-21

<150> JP 2002-46951
<151> 2002-02-22

<160> 172

<210> 1
<211> 377
<212> PRT
<213> Human

<400> 1
Met Arg Ala Asn Cys Ser Ser Ser Ala Cys Pro Ala Asn Ser Ser
                  5   10   15
Glu Glu Glu Leu Pro Val Gly Leu Glu Val His Gly Asn Leu Glu Leu
              20   25   30
Val Phe Thr Val Val Ser Thr Val Met Met Gly Leu Leu Met Phe Ser
          35   40   45
Leu Gly Cys Ser Val Glu Ile Arg Lys Leu Trp Ser His Ile Arg Arg
      50   55   60

1

```
Pro Trp Gly Ile Ala Val Gly Leu Leu Cys Gln Phe Gly Leu Met Pro
 65              70                  75                  80
Phe Thr Ala Tyr Leu Leu Ala Ile Ser Phe Ser Leu Lys Pro Val Gln
                85                  90                  95
Ala Ile Ala Val Leu Ile Met Gly Cys Cys Pro Gly Gly Thr Ile Ser
            100             105             110
Asn Ile Phe Thr Phe Trp Val Asp Gly Asp Met Asp Leu Ser Ile Ser
        115             120                 125
Met Thr Thr Cys Ser Thr Val Ala Ala Leu Gly Met Met Pro Leu Cys
    130             135             140
Ile Tyr Leu Tyr Thr Trp Ser Trp Ser Leu Gln Gln Asn Leu Thr Ile
145             150             155                 160
Pro Tyr Gln Asn Ile Gly Ile Thr Leu Val Cys Leu Thr Ile Pro Val
            165             170                 175
Ala Phe Gly Val Tyr Val Asn Tyr Arg Trp Pro Lys Gln Ser Lys Ile
            180             185                 190
Ile Leu Lys Ile Gly Ala Val Val Gly Gly Val Leu Leu Leu Val Val
            195             200             205
Ala Val Ala Gly Val Val Leu Ala Lys Gly Ser Trp Asn Ser Asp Ile
    210             215             220
Thr Leu Leu Thr Ile Ser Phe Ile Phe Pro Leu Ile Gly His Val Thr
225             230             235                 240
Gly Phe Leu Leu Ala Leu Phe Thr His Gln Ser Trp Gln Arg Cys Arg
            245             250             255
Thr Ile Ser Leu Glu Thr Gly Ala Gln Asn Ile Gln Met Cys Ile Thr
            260             265             270
Met Leu Gln Leu Ser Phe Thr Ala Glu His Leu Val Gln Met Leu Ser
    275             280             285
Phe Pro Leu Ala Tyr Gly Leu Phe Gln Leu Ile Asp Gly Phe Leu Ile
    290             295             300
Val Ala Ala Tyr Gln Thr Tyr Lys Arg Arg Leu Lys Asn Lys His Gly
305             310             315                 320
Lys Lys Asn Ser Gly Cys Thr Glu Val Cys His Thr Arg Lys Ser Thr
            325             330             335
Ser Ser Arg Glu Thr Asn Ala Phe Leu Glu Val Asn Glu Glu Gly Ala
        340             345             350
Ile Thr Pro Gly Pro Pro Gly Pro Met Asp Cys His Arg Ala Leu Glu
        355             360             365
Pro Val Gly His Ile Thr Ser Cys Glu
    370             375
```

```
<210> 2
<211> 1131
<212> DNA
<213> Human

<400> 2
atgagagcca attgttccag cagctcagcc tgccctgcca acagttcaga ggaggagctg    60
ccagtgggac tggaggtgca tggaaacctg agctcgtttt tcacagtggt gtccactgtg   120
atgatggggc tgctcatgtt ctctttggga tgttccgtgg agatccggaa gctgtggtcg   180
cacatcagga gaccctgggg cattgctgtg ggactgctct gccagtttgg gctcatgcct   240
tttacagctt atctcctggc cattagcttt tctctgaagc cagtccaagc tattgctgtt   300
ctcatcatgg gctgctgccc ggggggcacc atctctaaca ttttcacctt ctgggttgat   360
ggagatatgg atctcagcat cagtatgaca acctgttcca ccgtggccgc cctgggaatg   420
atgccactct gcatttatct ctacacctgg tcctggagtc ttcagcagaa tctcaccatt   480
ccttatcaga acataggaat taccttgtg tgcctgacca ttcctgtggc ctttggtgtc   540
tatgtgaatt acagatggcc aaaacaatcc aaaatcattc tcaagattgg ggccgttgtt   600
```

2

```
ggtggggtcc tccttctggt ggtcgcagtt gctggtgtgg tcctggcgaa aggatcttgg     660
aattcagaca tcacccttct gaccatcagt ttcatctttc ctttgattgg ccatgtcacg     720
ggttttctgc tggcactttt tacccaccag tcttggcaaa ggtgcaggac aatttcctta     780
gaaactggag ctcagaatat tcagatgtgc atcaccatgc tccagttatc tttcactgct     840
gagcacttgg tccagatgtt gagtttccca ctggcctatg gactcttcca gctgatagat     900
ggatttctta ttgttgcagc atatcagacg tacaagagga gattgaagaa caaacatgga     960
aaaaagaact caggttgcac agaagtctgc catacgagga aatcgacttc ttccagagag    1020
accaatgcct tcttggaggt gaatgaagaa ggtgccatca ctcctgggcc accagggcca    1080
atggattgcc acagggctct cgagccagtt ggccacatca cttcatgtga a              1131

<210> 3
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 3
aatgctgcct taaggagatg agga                                             24

<210> 4
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 4
cactggccct accaacaaga ttca                                             24

<210> 5
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 5
atgagagcca attgttccag cagc                                             24

<210> 6
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 6
ccagccagct agtccctgct attc                                             24

<210> 7
<211> 18
<212> DNA
```

3

<213> Artificial Sequence

<220>
<223> Primer

<400> 7
atttaggtga cactatag   18

<210> 8
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 8
aatacgactc actataggg   19

<210> 9
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 9
ttcgccagga ccacaccagc aact   24

<210> 10
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 10
agttgctggt gtggtcctgg cgaa   24

<210> 11
<211> 1152
<212> DNA
<213> Human

<400> 11
atgagagcca attgttccag cagctcagcc tgccctgcca acagttcaga ggaggagctg   60
ccagtgggac tggaggtgca tggaaacctg gagctcgttt tcacagtggt gtccactgtg   120
atgatggggc tgctcatgtt ctctttggga tgttccgtgg agatccggaa gctgtggtcg   180
cacatcagga gaccctgggg cattgctgtg ggactgctct gccagtttgg gctcatgcct   240
tttacagctt atctcctggc cattagcttt tctctgaagc cagtccaagc tattgctgtt   300
ctcatcatgg gctgctgccc ggggggcacc atctctaaca ttttcacctt ctgggttgat   360
ggagatatgg atctcagcat cagtatgaca acctgttcca ccgtggccgc cctgggaatg   420
atgccactct gcatttatct ctacacctgg tcctggagtc ttcagcagaa tctcaccatt   480
ccttatcaga acataggaat tacccttgtg tgcctgacca ttcctgtggc ctttggtgtc   540
tatgtgaatt acagatggcc aaaacaatcc aaaatcattc tcaagattgg ggccgttgtt   600

```
ggtggggtcc tccttctggt ggtcgcagtt gctggtgtgg tcctggcgaa aggatcttgg    660
aattcagaca tcacccttct gaccatcagt ttcatctttc ctttgattgg ccatgtcacg    720
ggttttctgc tggcactttt tacccaccag tcttggcaaa ggtgcaggac aatttcctta    780
gaaactggag ctcagaatat tcagatgtgc atcaccatgc tccagttatc tttcactgct    840
gagcacttgg tccagatgtt gagtttccca ctggcctatg gactcttcca gctgatagat    900
ggatttctta ttgttgcagc atatcagacg tacaagagga gattgaagaa caaacatgga    960
aaaaagaact caggttgcac agaagtctgc catacgagga aatcgacttc ttccagagag   1020
accaatgcct tcttggaggt gaatgaagaa ggtgccatca ctcctgggcc accagggcca   1080
atggattgcc acagggctct cgagccagtt ggccacatca cttcatgtga atagcaggga   1140
ctagctggct gg                                                       1152

<210> 12
<211> 1152
<212> DNA
<213> Human

<400> 12
atgagagcca attgttccag cagctcagcc tgccctgcca acagttcaga ggaggagctg     60
ccagtgggac tggaggtgca tggaaacctg gagctcgttt tcacagtggt gtccactgtg    120
atgatggggc tgctcatgtt ctctttggga tgttccgtgg agatccggaa gctgtggtcg    180
cacatcagga gaccctgggg cattgctgtg ggactgctct gccagtttgg gctcatgcct    240
tttacagctt atctcctggc cattagcttt tctctgaagc cagtccaagc tattgctgtt    300
ctcatcatgg gctgctgccc ggggggcacc atctctaacg ttttcacctt ctgggttgat    360
ggagatatgg atctcagcat cagtatgaca acctgttcca ccgtggccgc cctgggaatg    420
atgccactct gcatttatct ctacacctgg tcctggagtc ttcagcagaa tctcaccatt    480
ccttatcaga acataggaat taccccttgtg tgcctgacca ttcctgtggc ctttggtgtc    540
tatgtgaatt acagatggcc aaaacaatcc aaaatcattc tcaagattgg ggccgttgtt    600
ggtggggtcc tccttctggt ggtcgcagtt gctggtgtgg tcctggcgaa aggatcttgg    660
aattcagaca tcacccttct gaccatcagt ttcatctttc ctttgattgg ccatgtcacg    720
ggttttctgc tggcactttt tacccaccag tcttggcaaa ggtgcaggac aatttcctta    780
gaaactggag ctcagaatat tcagatgtgc atcaccatgc tccagttatc tttcactgct    840
gagcacttgg tccagatgtt gagtttccca ctggcctatg gactcttcca gctgatagat    900
ggatttctta ttgttgcagc atatcagacg tacaagagga gattgaagaa caaacatgga    960
aaaaagaact caggttgcac agaagtctgc catacgagga aatcgacttc ttccagagag   1020
accaatgcct tcttggaggt gaatgaagaa ggtgccatca ctcctgggcc accagggcca   1080
atggattgcc acagggctct cgagccagtt ggccacatca cttcatgtga atagcaggga   1140
ctagctggct gg                                                       1152

<210> 13
<211> 1131
<212> DNA
<213> Human

<400> 13
atgagagcca attgttccag cagctcagcc tgccctgcca acagttcaga ggaggagctg     60
ccagtgggac tggaggtgca tggaaacctg gagctcgttt tcacagtggt gtccactgtg    120
atgatggggc tgctcatgtt ctctttggga tgttccgtgg agatccggaa gctgtggtcg    180
cacatcagga gaccctgggg cattgctgtg ggactgctct gccagtttgg gctcatgcct    240
tttacagctt atctcctggc cattagcttt tctctgaagc cagtccaagc tattgctgtt    300
ctcatcatgg gctgctgccc ggggggcacc atctctaacg ttttcacctt ctgggttgat    360
ggagatatgg atctcagcat cagtatgaca acctgttcca ccgtggccgc cctgggaatg    420
atgccactct gcatttatct ctacacctgg tcctggagtc ttcagcagaa tctcaccatt    480
ccttatcaga acataggaat taccccttgtg tgcctgacca ttcctgtggc ctttggtgtc    540
tatgtgaatt acagatggcc aaaacaatcc aaaatcattc tcaagattgg ggccgttgtt    600
ggtggggtcc tccttctggt ggtcgcagtt gctggtgtgg tcctggcgaa aggatcttgg    660
aattcagaca tcacccttct gaccatcagt ttcatctttc ctttgattgg ccatgtcacg    720
ggttttctgc tggcactttt tacccaccag tcttggcaaa ggtgcaggac aatttcctta    780
```

5

```
gaaactggag ctcagaatat tcagatgtgc atcaccatgc tccagttatc tttcactgct    840
gagcacttgg tccagatgtt gagtttccca ctggcctatg gactcttcca gctgatagat    900
ggatttctta ttgttgcagc atatcagacg tacaagagga gattgaagaa caaacatgga    960
aaaaagaact caggttgcac agaagtctgc catacgagga aatcgacttc ttccagagag   1020
accaatgcct cttggaggt gaatgaagaa ggtgccatca ctcctgggcc accagggcca   1080
atggattgcc acagggctct cgagccagtt ggccacatca cttcatgtga a            1131
```

<210> 14
<211> 377
<212> PRT
<213> Human

<400> 14
```
Met Arg Ala Asn Cys Ser Ser Ser Ser Ala Cys Pro Ala Asn Ser Ser
                  5                   10                  15
Glu Glu Glu Leu Pro Val Gly Leu Glu Val His Gly Asn Leu Glu Leu
               20                  25                  30
Val Phe Thr Val Val Ser Thr Val Met Met Gly Leu Leu Met Phe Ser
            35                  40                  45
Leu Gly Cys Ser Val Glu Ile Arg Lys Leu Trp Ser His Ile Arg Arg
         50                  55                  60
Pro Trp Gly Ile Ala Val Gly Leu Leu Cys Gln Phe Gly Leu Met Pro
65                  70                  75                  80
Phe Thr Ala Tyr Leu Leu Ala Ile Ser Phe Ser Leu Lys Pro Val Gln
                  85                  90                  95
Ala Ile Ala Val Leu Ile Met Gly Cys Cys Pro Gly Gly Thr Ile Ser
               100                 105                 110
Asn Val Phe Thr Phe Trp Val Asp Gly Asp Met Asp Leu Ser Ile Ser
            115                 120                 125
Met Thr Thr Cys Ser Thr Val Ala Ala Leu Gly Met Met Pro Leu Cys
130                 135                 140
Ile Tyr Leu Tyr Thr Trp Ser Trp Ser Leu Gln Gln Asn Leu Thr Ile
145                 150                 155                 160
Pro Tyr Gln Asn Ile Gly Ile Thr Leu Val Cys Leu Thr Ile Pro Val
                  165                 170                 175
Ala Phe Gly Val Tyr Val Asn Tyr Arg Trp Pro Lys Gln Ser Lys Ile
               180                 185                 190
Ile Leu Lys Ile Gly Ala Val Val Gly Gly Val Leu Leu Leu Val Val
            195                 200                 205
Ala Val Ala Gly Val Val Leu Ala Lys Gly Ser Trp Asn Ser Asp Ile
         210                 215                 220
Thr Leu Leu Thr Ile Ser Phe Ile Phe Pro Leu Ile Gly His Val Thr
225                 230                 235                 240
Gly Phe Leu Leu Ala Leu Phe Thr His Gln Ser Trp Gln Arg Cys Arg
                  245                 250                 255
Thr Ile Ser Leu Glu Thr Gly Ala Gln Asn Ile Gln Met Cys Ile Thr
               260                 265                 270
Met Leu Gln Leu Ser Phe Thr Ala Glu His Leu Val Gln Met Leu Ser
            275                 280                 285
Phe Pro Leu Ala Tyr Gly Leu Phe Gln Leu Ile Asp Gly Phe Leu Ile
         290                 295                 300
Val Ala Ala Tyr Gln Thr Tyr Lys Arg Arg Leu Lys Asn Lys His Gly
305                 310                 315                 320
Lys Lys Asn Ser Gly Cys Thr Glu Val Cys His Thr Arg Lys Ser Thr
                  325                 330                 335
Ser Ser Arg Glu Thr Asn Ala Phe Leu Glu Val Asn Glu Glu Gly Ala
```

```
                340                    345                    350
Ile Thr Pro Gly Pro Pro Gly Pro Met Asp Cys His Arg Ala Leu Glu
        355                    360                    365
Pro Val Gly His Ile Thr Ser Cys Glu
    370                    375
```

<210> 15
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 15
tctgccatac gaggaaatcg a   21

<210> 16
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 16
caggagtgat ggcaccttct tc   22

<210> 17
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

<400> 17
tcttccagag agaccaatgc cttcttgg   28

<210> 18
<211> 798
<212> PRT
<213> Human

<400> 18
```
Met Ala Leu Gln Met Phe Val Thr Tyr Ser Pro Trp Asn Cys Leu Leu
                5                    10                    15
Leu Leu Val Ala Leu Glu Cys Ser Glu Ala Ser Ser Asp Leu Asn Glu
            20                    25                    30
Ser Ala Asn Ser Thr Ala Gln Tyr Ala Ser Asn Ala Trp Phe Ala Ala
        35                    40                    45
Ala Ser Ser Glu Pro Glu Glu Gly Ile Ser Val Phe Glu Leu Asp Tyr
    50                    55                    60
Asp Tyr Val Gln Ile Pro Tyr Glu Val Thr Leu Trp Ile Leu Leu Ala
65                    70                    75                    80
Ser Leu Ala Lys Ile Gly Phe His Leu Tyr His Arg Leu Pro Gly Leu
                85                    90                    95
```

7

```
Met Pro Glu Ser Cys Leu Leu Ile Leu Val Gly Ala Leu Val Gly Gly
            100                     105                     110
Ile Ile Phe Gly Thr Asp His Lys Ser Pro Pro Val Met Asp Ser Ser
        115                     120                     125
Ile Tyr Phe Leu Tyr Leu Leu Pro Pro Ile Val Leu Glu Gly Gly Tyr
    130                     135                     140
Phe Met Pro Thr Arg Pro Phe Phe Glu Asn Ile Gly Ser Ile Leu Trp
145                     150                     155                     160
Trp Ala Val Leu Gly Ala Leu Ile Asn Ala Leu Gly Ile Gly Leu Ser
                165                     170                     175
Leu Tyr Leu Ile Cys Gln Val Lys Ala Phe Gly Leu Gly Asp Val Asn
            180                     185                     190
Leu Leu Gln Asn Leu Leu Phe Gly Ser Leu Ile Ser Ala Val Asp Pro
        195                     200                     205
Val Ala Val Leu Ala Val Phe Glu Glu Ala Arg Val Asn Glu Gln Leu
    210                     215                     220
Tyr Met Met Ile Phe Gly Glu Ala Leu Leu Asn Asp Gly Ile Thr Val
225                     230                     235                     240
Val Leu Tyr Asn Met Leu Ile Ala Phe Thr Lys Met His Lys Phe Glu
                245                     250                     255
Asp Ile Glu Thr Val Asp Ile Leu Ala Gly Cys Ala Arg Phe Ile Val
            260                     265                     270
Val Gly Leu Gly Gly Val Leu Phe Gly Ile Val Phe Gly Phe Ile Ser
            275                     280                     285
Ala Phe Ile Thr Arg Phe Thr Gln Asn Ile Ser Ala Ile Glu Pro Leu
        290                     295                     300
Ile Val Phe Met Phe Ser Tyr Leu Ser Tyr Leu Ala Ala Glu Thr Leu
305                     310                     315                     320
Tyr Leu Ser Gly Ile Leu Ala Ile Thr Ala Cys Ala Val Thr Met Lys
                325                     330                     335
Lys Tyr Val Glu Glu Asn Val Ser Gln Thr Ser Tyr Thr Thr Ile Lys
            340                     345                     350
Tyr Phe Met Lys Met Leu Ser Ser Val Ser Glu Thr Leu Ile Phe Ile
            355                     360                     365
Phe Met Gly Val Ser Thr Val Gly Lys Asn His Glu Trp Asn Trp Ala
    370                     375                     380
Phe Ile Cys Phe Thr Leu Ala Phe Cys Gln Ile Trp Arg Ala Ile Ser
385                     390                     395                     400
Val Phe Ala Leu Phe Tyr Ile Ser Asn Gln Phe Arg Thr Phe Pro Phe
                405                     410                     415
Ser Ile Lys Asp Gln Cys Ile Ile Phe Tyr Ser Gly Val Arg Gly Ala
            420                     425                     430
Gly Ser Phe Ser Leu Ala Phe Leu Leu Pro Leu Ser Leu Phe Pro Arg
        435                     440                     445
Lys Lys Met Phe Val Thr Ala Thr Leu Val Val Ile Tyr Phe Thr Val
    450                     455                     460
Phe Ile Gln Gly Ile Thr Val Gly Pro Leu Val Arg Tyr Leu Asp Val
465                     470                     475                     480
Lys Lys Thr Asn Lys Lys Glu Ser Ile Asn Glu Glu Leu His Ile Arg
                485                     490                     495
Leu Met Asp His Leu Lys Ala Gly Ile Glu Asp Val Cys Gly His Trp
            500                     505                     510
Ser His Tyr Gln Val Arg Asp Lys Phe Lys Lys Phe Asp His Arg Tyr
        515                     520                     525
Leu Arg Lys Ile Leu Ile Arg Lys Asn Leu Pro Lys Ser Ser Ile Val
    530                     535                     540
Ser Leu Tyr Lys Lys Leu Glu Met Lys Gln Ala Ile Glu Met Val Glu
```

8

```
      545                550                555                560
Thr Gly Ile Leu Ser Ser Thr Ala Phe Ser Ile Pro His Gln Ala Gln
                        565                570                575
Arg Ile Gln Gly Ile Lys Arg Leu Ser Pro Glu Asp Val Glu Ser Ile
                580                585                590
Arg Asp Ile Leu Thr Ser Asn Met Tyr Gln Val Arg Gln Arg Thr Leu
                595                600                605
Ser Tyr Asn Lys Tyr Asn Leu Lys Pro Gln Thr Ser Glu Lys Gln Ala
        610                615                620
Lys Glu Ile Leu Ile Arg Arg Gln Asn Thr Leu Arg Glu Ser Met Arg
625                630                635                640
Lys Gly His Ser Leu Pro Trp Gly Lys Pro Ala Gly Thr Lys Asn Ile
                645                650                655
Arg Tyr Leu Ser Tyr Pro Tyr Gly Asn Pro Gln Ser Ala Gly Arg Asp
                660                665                670
Thr Arg Ala Ala Gly Phe Ser Asp Asp Asp Ser Ser Asp Pro Gly Ser
            675                680                685
Pro Ser Ile Thr Phe Ser Ala Cys Ser Arg Ile Gly Ser Leu Gln Lys
        690                695                700
Gln Glu Ala Gln Glu Ile Ile Pro Met Lys Ser Leu His Arg Gly Arg
705                710                715                720
Lys Ala Phe Ser Phe Gly Tyr Gln Arg Asn Thr Ser Gln Glu Glu Tyr
                725                730                735
Leu Gly Gly Val Arg Arg Val Ala Leu Arg Pro Lys Pro Leu Phe His
                740                745                750
Ala Val Asp Glu Glu Gly Glu Ser Gly Gly Glu Ser Glu Gly Lys Ala
            755                760                765
Ser Leu Val Glu Val Arg Ser Arg Trp Thr Ala Asp His Gly His Ser
        770                775                780
Arg Asp His His Arg Ser His Ser Pro Leu Leu Gln Lys Lys
785                790                795

<210> 19
<211> 2394
<212> DNA
<213> Human

<400> 19
atggctctgc agatgttcgt gacttacagt ccttggaatt gtttgctact gctagtggct    60
cttgagtgtt ctgaagcatc ttctgatttg aatgaatctg caaattccac tgctcagtat   120
gcatctaacg cttggtttgc tgctgccagc tcagagccag aggaagggat atctgttttt   180
gaactggatt atgactatgt gcaaattcct tatgaggtca ctctctggat acttctagca   240
tcccttgcaa aaataggctt ccacctctac cacaggctgc caggcctcat gccagaaagc   300
tgcctcctca tcctggtggg ggcgctggtg ggcggcatca tcttcggcac cgaccacaaa   360
tcacctccgg tcatggactc cagcatctac ttcctgtatc tcctgccacc catcgttctg   420
gagggcggct acttcatgcc caccccgccc ttctttgaga catcggctc catcctgtgg     480
tgggcagtat gggggcccct gatcaacgcc ttgggcattg cctctccct ctacctcatc      540
tgccaggtga aggccttttgg cctgggcgac gtcaacctgc tgcagaacct gctgttcggc   600
agcctgatct ccgccgtgga cccagtggcc gtgctagccg tgtttgagga gcgcgcgtg     660
aacgagcagc tctacatgat gatctttggg gaggccctgc tcaatgatgg cattactgtg   720
gtcttataca atatgttaat tgcctttaca aagatgcata aatttgaaga catagaaact    780
gtcgacattt tggctggatg tgcccgattc atcgttgtgg gcttggagg ggtattgttt     840
ggcatcgttt ttggatttat ttctgcattt atcacacgtt tcactcagaa tatctctgca    900
attgagccac tcatcgtctt catgttcagc tatttgtctt acttagctgc tgaaaccctc    960
tatctctccg gcatcctggc aatcacagcc tgcgcagtaa caatgaaaaa gtacgtggaa   1020
gaaacgtgt cccagacatc atacacgacc atcaagtact tcatgaagat gctgagcagc    1080
gtcagcgaga ccttgatctt catcttcatg ggtgtgtcca ctgtgggcaa gaatcacgag   1140
```

9

```
tggaactggg ccttcatctg cttcaccctg gccttctgcc aaatctggag agccatcagc  1200
gtatttgctc tcttctatat cagtaaccag tttcggactt tccccttctc catcaaggac  1260
cagtgcatca ttttctacag tggtgttcga ggagctggaa gttttttcact tgcattttttg  1320
cttcctctgt ctctttttcc taggaagaaa atgtttgtca ctgctactct agtagttata  1380
tactttactg tatttattca gggaatcaca gttggccctc tggtcaggta cctggatgtt  1440
aaaaaaacca ataaaaaga atccatcaat gaagagcttc atattcgtct gatggatcac  1500
ttaaaggctg gaatcgaaga tgtgtgtggg cactggagtc actaccaagt gagagacaag  1560
tttaagaagt ttgatcatag atacttacgg aaaatcctca tcagaaagaa cctacccaaa  1620 .
tcaagcattg tttctttgta caagaagctg gaaatgaagc aagccatcga gatggtggag  1680
actgggatac tgagctctac agctttctcc ataccccatc aggcccagag gatacaagga  1740
atcaaaagac tttcccctga agatgtggag tccataaggg acattctgac atccaacatg  1800
taccaagttc ggcaaaggac cctgtcctac aacaaataca acctcaaacc ccaaacaagt  1860
gagaagcagg ctaaagagat tctgatccgc cgccagaaca ccttaaggga gagcatgagg  1920
aaaggtcaca gcctgccctg gggaaagccg gctggcacca agaatatccg ctacctctcc  1980
tacccctacg ggaatcctca gtctgcagga agagacacaa gggctgctgg gttctcagat  2040
gatgacagca gtgatccagg atccccatcc atcacgttca gcgcatgctc tcggataggg  2100
tcacttcaga agcaagaggc acaagaaata ataccaatga gagcctaca cagaggaagg  2160
aaggcattca gctttggtta tcaaagaaac acaagccaag aagagtactt gggtggagta  2220
aggagggtgg ccttaagacc caaacctctg tttcatgcag tggatgagga gggtgagtct  2280
ggagggggaga gtgagggcaa ggcctctttg gttgaggttc ggtcgaggtg gacagctgac  2340
catggacaca gcagggacca tcacaggtcc catagtcctt tgctccaaaa aaaa  2394
```

<210> 20
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 20
ccatcctaat acgactcact atagggc   27

<210> 21
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 21
gcatgaagta gccgccctcc agaacga   27

<210> 22
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 22
actcactata gggctcgagc ggc   23

<210> 23
<211> 29

10

<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 23
cagaacgatg ggtggcagga gatacagga   29

<210> 24
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 24
cgccgccaga acaccttaag ggagagcat   29

<210> 25
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 25
ggctggcacc aagaatatcc gctacct   27

<210> 26
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 26
tccacacagg ggtgtaggta g   21

<210> 27
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 27
tgtggacaat aacactattt t   21

<210> 28
<211> 24
<212> DNA
<213> Artificial Sequence

11

```
<220>
<223> Primer

<400> 28
aggtaggaga agcccacagg aatg                                    24

<210> 29
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 29
caataacact atttttttg gagc                                     24

<210> 30
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 30
caggaaacag ctatgac                                            17

<210> 31
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 31
gtaaaacgac ggccag                                             16

<210> 32
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 32
cccttctttg agaacatcgg c                                       21

<210> 33
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
```

<223> Primer

<400> 33
aatgcccaag gcgttgatc   19

<210> 34
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 34
acagcctgcg cagtaacaat gaaaaagt   28

<210> 35
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 35
ttgtacaaga agctggaaat gaa   23

<210> 36
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 36
acttgatggt cgtgtatgat gtctg   25

<210> 37
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 37
ctgggcctga tggggtatgg agaaag   26

<210> 38
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

13

<400> 38
ccatcctgtg gtgggcagta ttggg   25

<210> 39
<211> 511
<212> DNA
<213> Human

<400> 39
aggtggatgc agtcactctc tagaagcctc cccgacttca gatgtgtggc acacatccac   60
acaggggtgt aggtaggaga agcccacagg aatggctctg cagatgttcg tgacttacag   120
tccttggaat tgtttgctac tgctagtggc tcttgagtgt tctgaagcat cttctgattt   180
gaatgaatct gcaaattcca ctgctcagta tgcatctaac gcttggtttg ctgctgccag   240
ctcagagcca gaggaaggga tatctgtttt tgaactggat tatgactatg tgcaaattcc   300
ttatgaggtc actctctgga tacttctagc atcccttgca aaaataggct tccacctcta   360
ccacaggctg ccaggcctca tgccagaaag ctgcctcctc atcctggtgg gggcgctggt   420
gggcggcatc atcttcggca ccgaccacaa atcacctccg gtcatggact ccagcatcta   480
cttcctgtat ctcctgccac ccatcgttct g   511

<210> 40
<211> 462
<212> DNA
<213> Human

<400> 40
ggctggcacc aagaatatcc gctacctctc ctacccctac gggaatcctc agtctgcagg   60
aagagacaca agggctgctg ggttctcaga tgatgacagc agtgatccag gatccccatc   120
catcacgttc agcgcatgct ctcggatagg gtcacttcag aagcaagagg cacaagaaat   180
aataccaatg aagagcctac acagaggaag gaaggcattc agctttggtt atcaaagaaa   240
cacaagccaa gaagagtact tgggtggagt aaggagggtg gccttaagac ccaaacctct   300
gtttcatgca gtggatgagg agggtgagtc tggaggggag agtgagggca aggcctcttt   360
ggttgaggtt cggtcgaggt ggacagctga ccatggacac agcagggacc atcacaggtc   420
ccatagtcct ttgctccaaa aaaaatagtg ttattgtcca ca   462

<210> 41
<211> 2426
<212> DNA
<213> Human

<400> 41
aggtaggaga agcccacagg aatggctctg cagatgttcg tgacttacag tccttggaat   60
tgtttgctac tgctagtggc tcttgagtgt tctgaagcat cttctgattt gaatgaatct   120
gcaaattcca ctgctcagta tgcatctaac gcttggtttg ctgctgccag ctcagagcca   180
gaggaaggga tatctgtttt tgaactggat tatgactatg tgcaaattcc ttatgaggtc   240
actctctgga tacttctagc atcccttgca aaaataggct tccacctcta ccacaggctg   300
ccaggcctca tgccagaaag ctgcctcctc atcctggtgg gggcgctggt gggcggcatc   360
atcttcggca ccgaccacaa atcacctccg gtcatggact ccagcatcta cttcctgtat   420
ctcctgccac ccatcgttct ggagggcggc tacttcatgc ccacccggcc cttctttgag   480
aacatcggct ccatcctgtg gtgggcagta ttgggggccc tgatcaacgc cttgggcatt   540
ggcctctccc tctacctcat ctgccaggtg aaggcctttg cctgggcga cgtcaacctg   600
ctgcagaacc tgctgttcgg cagcctgatc tccgccgtgg acccagtggc cgtgctagcc   660
gtgtttgagg aagcgcgcgt gaacgagcag ctctacatga tgatctttgg ggaggccctg   720
ctcaatgatg cattactgt ggtcttatac aatatgttaa ttgcctttac aaagatgcat   780
aaatttgaag acatagaaac tgtcgacatt ttggctggat gtgcccgatt catcgttgtg   840
gggcttggag gggtattgtt tggcatcgtt tttggattta tttctgcatt tatcacacgt   900
ttcactcaga atatctctgc aattgagcca ctcatcgtct tcatgttcag ctatttgtct   960
tacttagctg ctgaaaccct ctatctctcc ggcatcctgg caatcacagc ctgcgcagta   1020

14

```
acaatgaaaa agtacgtgga agaaaacgtg tcccagacat catacacgac catcaagtac 1080
ttcatgaaga tgctgagcag cgtcagcgag accttgatct tcatcttcat gggtgtgtcc 1140
actgtgggca agaatcacga gtggaactgg gccttcatct gcttcaccct ggccttctgc 1200
caaatctgga gagccatcag cgtatttgct ctcttctata tcagtaacca gtttcggact 1260
ttccccttct ccatcaagga ccagtgcatc attttctaca gtggtgttcg aggagctgga 1320
agtttttcac ttgcattttt gcttcctctg tctctttttc ctaggaagaa aatgtttgtc 1380
actgctactc tagtagttat atactttact gtatttattc agggaatcac agttggccct 1440
ctggtcaggt acctggatgt taaaaaaacc aataaaaaag aatccatcaa tgaagagctt 1500
catattcgtc tgatggatca cttaaaggct ggaatcgaag atgtgtgtgg cactggagt 1560
cactaccaag tgagagacaa gtttaagaag tttgatcata gatacttacg gaaaatcctc 1620
atcagaaaga acctacccaa atcaagcatt gtttctttgt acaagaagct ggaaatgaag 1680
caagccatcg agatggtgga gactgggata ctgagctcta cagctttctc catacccat 1740
caggcccaga ggatacaagg aatcaaaaga ctttcccctg aagatgtgga gtccataagg 1800
gacattctga catccaacat gtaccaagtt cggcaaagga ccctgtccta caacaaatac 1860
aacctcaaac cccaaacaag tgagaagcag gctaaagaga ttctgatccg ccgccagaac 1920
accttaaggg agagcatgag gaaaggtcac agcctgccct ggggaaagcc ggctggcacc 1980
aagaatatcc gctacctctc ctacccctac gggaatcctc agtctgcagg aagagacaca 2040
agggctgctg ggttctcaga tgatgacagc agtgatccag gatccccatc catcacgttc 2100
agcgcatgct ctcggatagg gtcacttcag aagcaagagg cacaagaaat aataccaatg 2160
aagagcctac acagaggaag gaaggcattc agctttggtt atcaaagaaa cacaagccaa 2220
gaagagtact ggtggagt aaggagggtg gccttaagac ccaaacctct gtttcatgca 2280
gtggatgagg agggtgagtc tggaggggag agtgagggca aggcctcttt ggttgaggtt 2340
cggtcgaggt ggacagctga ccatgacac agcagggacc atcacaggtc ccatagtcct 2400
ttgctccaaa aaaaatagtg ttattg                                    2426
```

<210> 42
<211> 1148
<212> PRT
<213> Human

<400> 42

```
Met Ser Arg Ala Thr Ser Val Gly Asp Gln Leu Glu Ala Pro Ala Arg
                5                   10                  15
Thr Ile Tyr Leu Asn Gln Pro His Leu Asn Lys Phe Arg Asp Asn Gln
            20                  25                  30
Ile Ser Thr Ala Lys Tyr Ser Val Leu Thr Phe Leu Pro Arg Phe Leu
        35                  40                  45
Tyr Glu Gln Ile Arg Arg Ala Ala Asn Ala Phe Phe Leu Phe Ile Ala
    50                  55                  60
Leu Leu Gln Gln Ile Pro Asp Val Ser Pro Thr Gly Arg Tyr Thr Thr
65                  70                  75                  80
Leu Val Pro Leu Ile Ile Ile Leu Thr Ile Ala Gly Ile Lys Glu Ile
                85                  90                  95
Val Glu Asp Phe Lys Arg His Lys Ala Asp Asn Ala Val Asn Lys Lys
            100                 105                 110
Lys Thr Ile Val Leu Arg Asn Gly Met Trp His Thr Ile Met Trp Lys
        115                 120                 125
Glu Val Ala Val Gly Asp Ile Val Lys Val Val Asn Gly Gln Tyr Leu
    130                 135                 140
Pro Ala Asp Val Val Leu Leu Ser Ser Ser Glu Pro Gln Ala Met Cys
145                 150                 155                 160
Tyr Val Glu Thr Ala Asn Leu Asp Gly Glu Thr Asn Leu Lys Ile Arg
                165                 170                 175
Gln Gly Leu Ser His Thr Ala Asp Met Gln Thr Arg Glu Val Leu Met
            180                 185                 190
Lys Leu Ser Gly Thr Ile Glu Cys Glu Gly Pro Asn Arg His Leu Tyr
        195                 200                 205
```

15

```
Asp Phe Thr Gly Asn Leu Asn Leu Asp Gly Lys Ser Leu Val Ala Leu
    210                 215             220
Gly Pro Asp Gln Ile Leu Leu Arg Gly Thr Gln Leu Arg Asn Thr Gln
225                 230             235                 240
Trp Val Phe Gly Ile Val Val Tyr Thr Gly His Asp Thr Lys Leu Met
            245                 250                 255
Gln Asn Ser Thr Lys Ala Pro Leu Lys Arg Ser Asn Val Glu Lys Val
            260                 265                 270
Thr Asn Val Gln Ile Leu Val Leu Phe Gly Ile Leu Leu Val Met Ala
        275                 280             285
Leu Val Ser Ser Ala Gly Ala Leu Tyr Trp Asn Arg Ser His Gly Glu
    290                 295             300
Lys Asn Trp Tyr Ile Lys Lys Met Asp Thr Thr Ser Asp Asn Phe Gly
305                 310             315                 320
Tyr Asn Leu Leu Thr Phe Ile Ile Leu Tyr Asn Asn Leu Ile Pro Ile
            325                 330             335
Ser Leu Leu Val Thr Leu Glu Val Val Lys Tyr Thr Gln Ala Leu Phe
            340                 345             350
Ile Asn Trp Asp Thr Asp Met Tyr Tyr Ile Gly Asn Asp Thr Pro Ala
        355                 360             365
Met Ala Arg Thr Ser Asn Leu Asn Glu Glu Leu Gly Gln Val Lys Tyr
    370                 375             380
Leu Phe Ser Asp Lys Thr Gly Thr Leu Thr Cys Asn Ile Met Asn Phe
385                 390             395                 400
Lys Lys Cys Ser Ile Ala Gly Val Thr Tyr Gly His Phe Pro Glu Leu
            405                 410             415
Ala Arg Glu Pro Ser Ser Asp Asp Phe Cys Arg Met Pro Pro Pro Cys
            420                 425             430
Ser Asp Ser Cys Asp Phe Asp Asp Pro Arg Leu Leu Lys Asn Ile Glu
            435                 440             445
Asp Arg His Pro Thr Ala Pro Cys Ile Gln Glu Phe Leu Thr Leu Leu
    450                 455             460
Ala Val Cys His Thr Val Val Pro Glu Lys Asp Gly Asp Asn Ile Ile
465                 470             475                 480
Tyr Gln Ala Ser Ser Pro Asp Glu Ala Ala Leu Val Lys Gly Ala Lys
            485                 490             495
Lys Leu Gly Phe Val Phe Thr Ala Arg Thr Pro Phe Ser Val Ile Ile
            500                 505             510
Glu Ala Met Gly Gln Glu Gln Thr Phe Gly Ile Leu Asn Val Leu Glu
        515                 520             525
Phe Ser Ser Asp Arg Lys Arg Met Ser Val Ile Val Arg Thr Pro Ser
    530                 535             540
Gly Arg Leu Arg Leu Tyr Cys Lys Gly Ala Asp Asn Val Ile Phe Glu
545                 550             555                 560
Arg Leu Ser Lys Asp Ser Lys Tyr Met Glu Glu Thr Leu Cys His Leu
            565                 570             575
Glu Tyr Phe Ala Thr Glu Gly Leu Arg Thr Leu Cys Val Ala Tyr Ala
            580                 585             590
Asp Leu Ser Glu Asn Glu Tyr Glu Glu Trp Leu Lys Val Tyr Gln Glu
            595                 600             605
Ala Ser Thr Ile Leu Lys Asp Arg Ala Gln Arg Leu Glu Glu Cys Tyr
    610                 615             620
Glu Ile Ile Glu Lys Asn Leu Leu Leu Leu Gly Ala Thr Ala Ile Glu
625                 630             635                 640
Asp Arg Leu Gln Ala Gly Val Pro Glu Thr Ile Ala Thr Leu Leu Lys
            645                 650             655
Ala Glu Ile Lys Ile Trp Val Leu Thr Gly Asp Lys Gln Glu Thr Ala
```

16

```
                660                    665                    670
Ile Asn Ile Gly Tyr Ser Cys Arg Leu Val Ser Gln Asn Met Ala Leu
            675                    680                    685
Ile Leu Leu Lys Glu Asp Ser Leu Asp Ala Thr Arg Ala Ala Ile Thr
        690                    695                    700
Gln His Cys Thr Asp Leu Gly Asn Leu Leu Gly Lys Glu Asn Asp Val
705                    710                    715                    720
Ala Leu Ile Ile Asp Gly His Thr Leu Lys Tyr Ala Leu Ser Phe Glu
                725                    730                    735
Val Arg Arg Ser Phe Leu Asp Leu Ala Leu Ser Cys Lys Ala Val Ile
            740                    745                    750
Cys Cys Arg Val Ser Pro Leu Gln Lys Ser Glu Ile Val Asp Val Val
            755                    760                    765
Lys Lys Arg Val Lys Ala Ile Thr Leu Ala Ile Gly Asp Gly Ala Asn
        770                    775                    780
Asp Val Gly Met Ile Gln Thr Ala His Val Gly Val Gly Ile Ser Gly
785                    790                    795                    800
Asn Glu Gly Met Gln Ala Thr Asn Asn Ser Asp Tyr Ala Ile Ala Gln
                805                    810                    815
Phe Ser Tyr Leu Glu Lys Leu Leu Leu Val His Gly Ala Trp Ser Tyr
            820                    825                    830
Asn Arg Val Thr Lys Cys Ile Leu Tyr Cys Phe Tyr Lys Asn Val Val
            835                    840                    845
Leu Tyr Ile Ile Glu Leu Trp Phe Ala Phe Val Asn Gly Phe Ser Gly
        850                    855                    860
Gln Ile Leu Phe Glu Arg Trp Cys Ile Gly Leu Tyr Asn Val Ile Phe
865                    870                    875                    880
Thr Ala Leu Pro Pro Phe Thr Leu Gly Ile Phe Glu Arg Ser Cys Thr
                885                    890                    895
Gln Glu Ser Met Leu Arg Phe Pro Gln Leu Tyr Lys Ile Thr Gln Asn
            900                    905                    910
Gly Glu Gly Phe Asn Thr Lys Val Phe Trp Gly His Cys Ile Asn Ala
            915                    920                    925
Leu Val His Ser Leu Ile Leu Phe Trp Phe Pro Met Lys Ala Leu Glu
        930                    935                    940
His Asp Thr Val Leu Thr Ser Gly His Ala Thr Asp Tyr Leu Phe Val
945                    950                    955                    960
Gly Asn Ile Val Tyr Thr Tyr Val Val Val Thr Val Cys Leu Lys Ala
                965                    970                    975
Gly Leu Glu Thr Thr Ala Trp Thr Lys Phe Ser His Leu Ala Val Trp
            980                    985                    990
Gly Ser Met Leu Thr Trp Leu Val Phe Phe Gly Ile Tyr Ser Thr Ile
            995                   1000                   1005
Trp Pro Thr Ile Pro Ile Ala Pro Asp Met Arg Gly Gln Ala Thr Met
    1010                   1015                   1020
Val Leu Ser Ser Ala His Phe Trp Leu Gly Leu Phe Leu Val Pro Thr
1025                   1030                   1035                   1040
Ala Cys Leu Ile Glu Asp Val Ala Trp Arg Ala Ala Lys His Thr Cys
                1045                   1050                   1055
Lys Lys Thr Leu Leu Glu Glu Val Gln Glu Leu Glu Thr Lys Ser Arg
            1060                   1065                   1070
Val Leu Gly Lys Ala Val Leu Arg Asp Ser Asn Gly Lys Arg Leu Asn
        1075                   1080                   1085
Glu Arg Asp Arg Leu Ile Lys Arg Leu Gly Arg Lys Thr Pro Pro Thr
    1090                   1095                   1100
Leu Phe Arg Gly Ser Ser Leu Gln Gln Gly Val Pro His Gly Tyr Ala
1105                   1110                   1115                   1120
```

17

Phe Ser Gln Glu Glu His Gly Ala Val Ser Gln Glu Glu Val Ile Arg
        1125   1130   1135
Ala Tyr Asp Thr Thr Lys Lys Lys Ser Arg Lys Lys
        1140   1145

<210> 43
<211> 3444
<212> DNA
<213> Human

<400> 43
```
atgtcccggg ccacgtctgt tggagaccag ctggaggcac ccgcccgcac catttacctc   60
aaccaaccgc atctcaacaa attccgcgac aaccagatca gtacggccaa gtacagcgtg  120
ttgacatttc tacctcgatt cttgtatgag cagattagaa gagctgctaa tgccttcttt  180
ctcttcattg ccttattaca gcaaattcca gatgtatctc aacaggaag atataccacc  240
ctggtgccat tgatcattat tttaacaatt gcaggcatca aagagattgt agaagatttt  300
aagcgacaca aggcagacaa tgcagttaac aaaaagaaa caatagtgtt aagaaatggt  360
atgtggcata ccattatgtg gaaagaggtg gcagtgggag acattgtgaa ggtcgtcaat  420
gggcagtatc ttccagcaga gtgtggtcctg ctgtcatcca gtgaacctca ggcaatgtgt  480
tatgttgaaa cagctaatct ggatggggag cgaaccttta aaatacgtca gggtttgagt  540
cacactgctg acatgcaaac acgtgaagtt ctgatgaagt tatctggaac tatagagtgt  600
gaagggccca accgccacct ctatgacttc actggaaact tgaacttaga tgggaaaagc  660
cttgttgccc ttgggcctga ccagatctta ttaagaggta cacagcttag aaatactcag  720
tgggtctttg gcatagttgt ttatactgga cacgacacca aactcatgca gaattcaacc  780
aaagcgcctc tcaagagatc aaatgttgag aaggtgacta cgtgcagat cctggtgttg  840
tttggcatcc tcttggtcat ggccttggtg agctcggcgg gggccctgta ctggaacagg  900
tctcatggtg aaaagaactg gtacatcaag aagatggaca ccacctcaga taattttgga  960
tacaacctac tgacgttcat catcttatac aacaatctta ttcccatcag tctgttggtg 1020
actcttgagg ttgtgaagta tactcaagcc ttttttcataa actgggacac agatatgtat 1080
tatataggaa atgacactcc tgccatggcc aggacatcaa accttaatga gagcttggg 1140
caggtgaaat atctcttttc tgacaagact ggaacgctta catgcaatat catgaacttt 1200
aagaagtgca gcattgccgg agtaacctat ggtcacttcc agaattggc aagagagccg 1260
tcttcagatg acttctgtcg gatgcctcct ccctgtagtg attcctgtga ctttgatgac 1320
cccaggctgt tgaagaacat tgaggatcgc catcccacag cccccttgcat tcaggagttc 1380
ctcacccttc tggccgtgtg ccacacggtt gttcctgaga aggatggaga taacatcatc 1440
taccaggcct cttcccccaga tgaagctgct ttggtgaaag agctaaaaa gctgggcttt 1500
gtcttcacag ccagaacacc attctcagtc atcatagaag cgatgggaca ggaacaaaca 1560
ttcggaatcc ttaatgtcct ggaattttct agtgacagaa aaagaatgtc tgtaattgtt 1620
cgaactcctt caggacgact tcggctttac tgtaaagggg ctgataatgt gattttttgag 1680
agactttcaa aagactcaaa atatatggag gaaacattat gccatctgga atactttgcc 1740
acggaaggct tgcggactct ctgtgtggct tatgctgatc tctctgagaa tgagtatgag 1800
gagtggctga aagtctatca ggaagccagc accatattga aggacagagc tcaacggttg 1860
gaagagtgtt acgagatcat tgaagaaat ttgctgctac ttggagccac agccatagaa 1920
gatcgccttc aagcaggagt tccagaaacc atcgcaacac tgttgaaggc agaaattaaa 1980
atatgggtgt tgacaggaga caaacaagaa actgcgatta atataggta ttcctgccga 2040
ttggtatcgc agaatatggc ccttatccta ttgaaggagg actctttgga tgccacaagg 2100
gcagccatta ctcagcactg cactgacctt gggaatttgc tgggcaagga aatgacgtg 2160
gccctcatca tcgatggcca caccctgaag tacgcgctct ccttcgaagt ccggaggagt 2220
ttcctggatt tggcactctc gtgcaaagcg gtcatatgct gcagagtgtc tcctctgcag 2280
aagtctgaga tagtggatgt ggtgaagaag cgggtgaagg ccatcaccct cgccatcgga 2340
gacggcgcca cgatgtcgg gatgatccag acagcccacg tgggtgtggg aatcagtggg 2400
aatgaaggca tgcaggccac caacaactcg gattacgcca tcgcacagtt ttcctactta 2460
gagaagcttc tgttggttca tggagcctgg agctacaacc gggtgaccaa gtgcatcttg 2520
tactgcttct ataagaacgt ggtcctgtat attattgagc tttggttcgc ctttgttaat 2580
ggattttctg ggcagatttt atttgaacgt tggtgcatcg gcctgtacaa tgtgatttttc 2640
accgctttgc cgcccttcac tctgggaatc tttgagaggt cttgcactca ggagagcatg 2700
ctcaggtttc cccagctcta caaaatcacc cagaatggcg aaggcttcaa cacaaaggtt 2760
```

18

```
ttctggggtc actgcatcaa cgccttggtc cactccctca tcctcttctg gtttcccatg    2820
aaagctctgg agcatgatac tgtgttgaca agtggtcatg ctaccgacta tttatttgtt    2880
ggaaatattg tttacacata tgttgttgtt actgtttgtc tgaaagctgg tttggagacc    2940
acagcttgga ctaaattcag tcatctggct gtctggggaa gcatgctgac ctggctggtg    3000
ttttttggca tctactcgac catctggccc accattccca ttgctccaga tatgagagga    3060
caggcaacta tggtcctgag ctccgcacac ttctggttgg gattatttct ggttcctact    3120
gcctgtttga ttgaagatgt ggcatggaga gcagccaagc acacctgcaa aaagacattg    3180
ctggaggagg tgcaggagct ggaaaccaag tctcgagtcc tgggaaaagc ggtgctgcgg    3240
gatagcaatg gaaagaggct gaacgagcgc gaccgcctga tcaagaggct gggccggaag    3300
acgcccccga cgctgttccg gggcagctcc ctgcagcagg gcgtcccgca tgggtatgct    3360
ttttctcaag aagaacacgg agctgttagt caggaagaag tcatccgtgc ttatgacacc    3420
accaaaaaga aatccaggaa gaaa    3444
```

\<210\> 44
\<211\> 23
\<212\> DNA
\<213\> Artificial Sequence

\<220\>
\<223\> Primer

\<400\> 44
ctttgggcta taagaaggca gag   23

\<210\> 45
\<211\> 24
\<212\> DNA
\<213\> Artificial Sequence

\<220\>
\<223\> Primer

\<400\> 45
aggtttgcga gggaatatgt aact   24

\<210\> 46
\<211\> 18
\<212\> DNA
\<213\> Artificial Sequence

\<220\>
\<223\> Primer

\<400\> 46
atttaggtga cactatag   18

\<210\> 47
\<211\> 19
\<212\> DNA
\<213\> Artificial Sequence

\<220\>
\<223\> Primer

\<400\> 47
aatacgactc actataggg   19

19

```
<210> 48
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 48
tcaagaagat ggacaccacc tcag                                    24

<210> 49
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 49
gccagtttat gaaaagggct tgag                                    24

<210> 50
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 50
ttcgccagga ccacaccagc aact                                    24

<210> 51
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 51
tcgcagtttc ttgtttgtct cctg                                    24

<210> 52
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 52
acctcaggca atgtgttatg                                         20

<210> 53
<211> 20
```

<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 53
agcgatggga caggaacaaa   20

<210> 54
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 54
agttgctggt gtggtcctgg cgaa   24

<210> 55
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 55
ctgggcagat tttatttgaa   20

<210> 56
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 56
cctgagctcc gcacacttct   20

<210> 57
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 57
cataacacat tgcctgaggt   20

<210> 58
<211> 20
<212> DNA
<213> Artificial Sequence

21

<220>
<223> Primer

<400> 58
ttcaaataaa atctgcccag   20

<210> 59
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 59
agaagtgtgc ggagctcagg   20

<210> 60
<211> 3643
<212> DNA
<213> Human

<400> 60

```
ctttgggcta taagaaggca gaggatgaga tgtcccgggc cacgtctgtt ggagaccagc     60
tggaggcacc cgcccgcacc atttacctca accaaccgca tctcaacaaa ttccgcgaca    120
accagatcag tacggccaag tacagcgtgt tgacatttct acctcgattc ttgtatgagc    180
agattagaag agctgctaat gccttctttc tcttcattgc cttattacag caaattccag    240
atgtatctcc aacaggaaga tataccaccc tggtgccatt gatcattatt ttaacaattg    300
caggcatcaa agagattgta gaagatttta agcgacacaa ggcagacaat gcagttaaca    360
aaaagaaaac aatagtgtta agaaatggta tgtggcatac cattatgtgg aaagaggtgg    420
cagtgggaga cattgtgaag gtcgtcaatg ggcagtatct tccagcagat gtggtcctgc    480
tgtcatccag tgaacctcag gcaatgtgtt atgttgaaac agctaatctg gatggggaga    540
cgaaccttaa aatacgtcag ggtttgagtc acactgctga catgcaaaca cgtgaagttc    600
tgatgaagtt atctggaact atagagtgtg aagggcccaa ccgccacctc tatgacttca    660
ctggaaactt gaacttagat gggaaaagcc ttgttgccct tgggcctgac cagatcttat    720
taagaggtac acagcttaga aatactcagt gggtctttgg catagttgtt tatactggac    780
acgacaccaa actcatgcag aattcaacca aagcgcctct caagagatca aatgttgaga    840
aggtgactaa cgtgcagatc ctggtgttgt ttggcatcct cttggtcatg gccttggtga    900
gctcggcggg ggccctgtac tggaacaggt ctcatggtga aaagaactgg tacatcaaga    960
agatggacac cacctcagat aattttggat acaacctact gacgttcatc atcttataca   1020
acaatcttat tcccatcagt ctgttggtga ctcttgaggt tgtgaagtat actcaagccc   1080
ttttcataaa ctgggacaca gatatgtatt atataggaaa tgacactcct gccatggcca   1140
ggacatcaaa ccttaatgaa gagcttgggc aggtgaaata tctcttttct gacaagactg   1200
gaacgcttac atgcaatatc atgaacttta gaaagtgcag cattgccgga gtaacctatg   1260
gtcacttccc agaattggca agagagccgt cttcagatga cttctgtcgg atgcctcctc   1320
cctgtagtga ttcctgtgac tttgatgacc ccaggctgtt gaagaacatt gaggatcgcc   1380
atcccacagc cccttgcatt caggagttcc tcacccttct ggccgtgtgc cacacggttg   1440
ttcctgagaa ggatggagat aacatcatct accaggcctc ttccccagat gaagctgctt   1500
tggtgaaagg agctaaaaag ctgggctttg tcttcacagc cagaacacca ttctcagtca   1560
tcatagaagc gatgggacag gaacaaacat tcggaatcct taatgtcctg gaattttcta   1620
gtgacagaaa aagaatgtct gtaattgttc gaactccttc aggacgactt cggctttact   1680
gtaaaggggc tgataatgtg attttttgaga gactttcaaa agactcaaaa tatatggagg   1740
aaacattatg ccatctggaa tactttgcca cggaaggctt gcggactctc tgtgtggctt   1800
atgctgatct ctctgagaat gagtatgagg agtggctgaa agtctatcag gaagccagca   1860
ccatattgaa ggacagagct caacggttgg aagagtgtta cgagatcatt gagaagaatt   1920
tgctgctact tggagccaca gccatagaag atcgccttca agcaggagtt ccagaaacca   1980
```

```
tcgcaacact gttgaaggca gaaattaaaa tatgggtgtt gacaggagac aaacaagaaa    2040
ctgcgattaa tatagggtat tcctgccgat tggtatcgca gaatatggcc cttatcctat    2100
tgaaggagga ctctttggat gccacaaggg cagccattac tcagcactgc actgaccttg    2160
ggaatttgct gggcaaggaa aatgacgtgg ccctcatcat cgatggccac accctgaagt    2220
acgcgctctc cttcgaagtc cggaggagtt tcctggattt ggcactctcg tgcaaagcgg    2280
tcatatgctg cagagtgtct cctctgcaga agtctgagat agtggatgtg gtgaagaagc    2340
gggtgaaggc catcaccctc gccatcggag acggcgccaa cgatgtcggg atgatccaga    2400
cagcccacgt gggtgtggga atcagtggga atgaaggcat gcaggccacc aacaactcgg    2460
attacgccat cgcacagttt tcctacttag agaagcttct gttggttcat ggagcctgga    2520
gctacaaccg ggtgaccaag tgcatcttgt actgcttcta taagaacgtg gtcctgtata    2580
ttattgagct ttggttcgcc tttgttaatg gatttctgg gcagatttta tttgaacgtt     2640
ggtgcatcgg cctgtacaat gtgattttca ccgctttgcc gcccttcact ctgggaatct    2700
ttgagaggtc ttgcactcag gagagcatgc tcaggtttcc ccagctctac aaaatcaccc    2760
agaatggcga aggcttcaac acaaaggttt tctggggtca ctgcatcaac gccttggtcc    2820
actccctcat cctcttctgg tttcccatga aagctctgga gcatgatact gtgttgacaa    2880
gtggtcatgc taccgactat ttatttgttg gaaatattgt ttacacatat gttgttgtta    2940
ctgtttgtct gaaagctggt ttggagacca cagcttggac taaaattcagt catctggctg    3000
tctggggaag catgctgacc tggctggtgt tttttggcat ctactcgacc atctggccca    3060
ccattcccat tgctccagat atgagaggac aggcaactat ggtcctgagc tccgcacact    3120
tctggttggg attatttctg gttcctactg cctgtttgat tgaagatgtg gcatggagag    3180
cagccaagca cacctgcaaa aagacattgc tggaggaggt gcaggagctg gaaaccaagt    3240
ctcgagtcct gggaaaagcg gtgctgcggg atagcaatgg aaagaggctg aacgagcgcg    3300
accgcctgat caagaggctg ggccggaaga cgccccccgac gctgttccgg ggcagctccc    3360
tgcagcaggg cgtcccgcat gggtatgctt tttctcaaga agaacacgga gctgttagtc    3420
aggaagaagt catccgtgct tatgacacca ccaaaaagaa atccaggaag aaataagaca    3480
tgaattttcc tgactgatct taggaaagag attcagtttg ttgcacccag tgttaacaca    3540
tctttgtcag agaagactgg cgtcagcagc caaaacacca ggaaacacat ttctgtggcc    3600
ttagccaagc agtttgttag ttacatattc cctcgcaaac cta                      3643

<210> 61
<211> 3643
<212> DNA
<213> Human

<400> 61
ctttgggcta taagaaggca gaggatgaga tgtcccgggc cacgtctgtt ggagaccagc      60
tggaggcacc cgcccgcacc atttacctca accaaccgca tctcaacaaa ttccgcgaca     120
accagatcag tacggccaag tacagcgtgt tgacatttct acctcgattc ttgtatgagc     180
agattagaag agctgctaat gccttctttc tcttcattgc cttattacag caaattccag     240
atgtatctcc aacaggaaga tataccaccc tggtgccatt gatcattatt ttaacaattg     300
caggcatcaa agagattgta gaagatttta agcgacacaa ggcagacaat gcagttaaca     360
aaaagaaaac aatagtgtta agaaatggta tgtggcatac cattatgtgg aaagaggtgg     420
cagtgggaga cattgtgaag gtcgtcaatg ggcagtatct tccagcagat gtggtcctgc     480
tgtcatccag tgaacctcag gcaatgtgtt atgttgaaac agctaatctg gatggggaga     540
cgaaccttaa aatacgtcag ggtttgagtc acactgctga catgcaaaca cgtgaagttc     600
tgatgaagtt atctggaact atagagtgtg aagggcccaa ccgccacctc tatgacttca     660
ctggaaactt gaacttagat gggaaaagcc ttgttgccct tgggcctgac cagatcttat     720
taagaggtac acagcttaga aatactcagt gggtctttgg catagttgtt tatactggac     780
acgacaccaa actcatgcag aattcaacca aagcgcctct caagagatca aatgttgaga     840
aggtgactaa cgtgcagatc ctggtgttgt ttggcatcct cttggtcatg gccttggtga     900
gctcggcggg ggccctgtac tggaacaggt ctcatggtga aaagaactgg tacatcaaga     960
agatggacac cacctcagat aattttggat acaacctact gacgttcatc atcttataca    1020
acaatcttat tcccatcagt ctgttggtga ctcttgaggt tgtgaagtat actcaagccc    1080
ttttcataaa ctgggacaca gatatgtatt atataggaaa tgacactcct gccatggcca    1140
ggacatcaaa ccttaatgaa gagcttgggc aggtgaaata tctcttttct gacaagactg    1200
gaacgcttac atgcaatatc atgaacttta agaagtgcag cattgccgga gtaacctatg    1260
gtcacttccc agaattggca agagagccgt cttcagatga cttctgtcgg atgcctcctc    1320
```

23

```
cctgtagtga ttcctgtgac tttgatgacc ccaggctgtt gaagaacatt gaggatcgcc   1380
atcccacagc cccttgcatt caggagttcc tcaccttct ggccgtgtgc cacacggttg   1440
ttcctgagaa ggatggagat aacatcatct accaggcctc ttccccagat gaagctgctt   1500
tggtgaaagg agctaaaaag ctgggcttg tcttcacagc cagaacacca ttctcagtca   1560
tcatagaagc gatgggacag gaacaaacat tcggaatcct taatgtcctg gaatttttcta  1620
gtgacagaaa aagaatgtct gtaattgttc gaactccttc aggacgactt cggctttact   1680
gtaaaggggc tgataatgtg attttttgaga gactttcaaa agactcaaaa tatatggagg   1740
aaacattatg ccatctggaa tactttgcca cggaaggctt gcggactctc tgtgtggctt   1800
atgctgatct ctctgagaat gagtatgagg agtggctgaa agtctatcag gaagccagca   1860
ccatattgaa ggacagagct caacggttgg aagagtgtta cgagatcatt gagaagaatt   1920
tgctgctact tggagccaca gccatagaag atcgccttca agcaggagtt ccagaaacca   1980
tcgcaacact gttgaaggca gaaattaaaa tatgggtgtt gacaggagac aaacaagaaa   2040
ctgcgattaa tatagggtat tcctgccgat tggtatcgca gaatatggcc cttatcctat   2100
tgaaggagga ctctttggat gccacaaggg cagccattac tcagcactgc actgaccttg   2160
ggaatttgct gggcaaggaa aatgacgtgg ccctcatcat cgatggccac accctgaagt   2220
acgcgctctc cttcgaagtc cggaggagtt tcctggattt ggcactctcg tgcaaagcgg   2280
tcatatgctg cagagtgtct cctctgcaga agtctgagat agtggatgtg gtgaagaagc   2340
gggtgaaggc catcaccctc gccatcggag acggcgccaa cgatgtcggg atgatccaga   2400
cagcccacgt gggtgtggga atcagtggga atgaaggcat gcaggccacc aacaactcgg   2460
attacgccat cgcacagttt tcctacttag agaagcttct gttggttcat ggagcctgga   2520
gctacaaccg ggtgaccaag tgcatcttgt actgcttcta taagaacgtg gtcctgtata   2580
ttattgagct ttggttcgcc tttgttaatg gattttctgg gcagatttta tttgaacgtt   2640
ggtgcatcgg cctgtacaat gtgattttca ccgctttgcc gcccttcact ctgggaatct   2700
ttgagaggtc ttgcactcag gagagcatgc tcaggtttcc ccagctctac aaaatcaccc   2760
agaatggcga aggcttcaac acaaaggttt tctggggtca ctgcatcaac gccttggtcc   2820
actcccctcat cctcttctgg tttcccatga agctctgga gcatgatact gtgttgacaa   2880
gtggtcatgc taccgactat ttatttgttg gaaatattgt ttacacatat gttgttgtta   2940
ctgtttgtct gaaagctggt ttggagacca cagcttggac taaaattcagt catctggctg   3000
tctggggaag catgctgacc tggctggtgt tttttggcat ctactcgacc atctggccca   3060
ccattcccat tgctccagat atgagaggac aggcaactat ggtcctgagc tccgcacact   3120
tctggttggg attatttctg gttcctactg cctgtttgat tgaagatgtg gcatggagag   3180
cagccaagca cacctgcaaa aagacattgc tggaggaggt gcaggagctg gaaaccaagt   3240
ctcgagtcct gggaaaagcg gtgctgcggg atagcaatgg aaagaggctg aacgagcgcg   3300
accgcctgat caagaggctg ggccggaaga cgcccccgac gctgttccgg ggcagctccc   3360
tgcagcaggg cgtcccgcat gggtatgctt tttctcaaga agaacacgga gctgttagtc   3420
aggaagaagt catccgtgct tatgacacca ccaaaaagaa atccaggaag aaataagaca   3480
tgaattttcc tgactgatct taggaaagag attcagtttg ttgcacccag tgttaacaca   3540
tctttgtcag agaagactgg cgtcagcagc caaaacacca ggaaacacat ttctgtggcc   3600
ttagccaagc agtttgttag ttacatattc cctcgcaaac cta                     3643
```

<210> 62
<211> 3444
<212> DNA
<213> Human

<400> 62

```
atgtcccggg ccacgtctgt tggagaccag ctggaggcac ccgcccgcac catttacctc    60
aaccaaccgc atctcaacaa attccgcgac aaccagatca gtacggccaa gtacagcgtg   120
ttgacatttc tacctcgatt cttgtatgag cagattagaa gagctgctaa tgccttcttt   180
ctcttcattg ccttattaca gcaaattcca gatgtatctc aacaggaag atataccacc   240
ctggtgccat tgatcattat tttaacaatt gcaggcatca aagagattgt agaagatttt   300
aagcgacaca aggcagacaa tgcagttaac aaaaagaaaa caatagtgtt aagaaatggt   360
atgtggcata ccattatgtg gaaagaggtg gcagtgggag acattgtgaa ggtcgtcaat   420
gggcagtatc ttccagcaga tgtggtcctg ctgtcatcca gtgaacctca ggcaatgtgt   480
tatgttgaaa cagctaatct ggatggggag acgaaccttt aaaatacgtca gggtttgagt   540
cacactgctg acatgcaaac acgtgaagtt ctgatgaagt tatctggaac tatagagtgt   600
gaagggccca accgccacct ctatgacttc actggaaact tgaacttaga tgggaaaagc   660
```

24
```

```
cttgttgccc ttgggcctga ccagatctta ttaagaggta cacagcttag aaatactcag    720
tgggtctttg gcatagttgt ttatactgga cacgacacca aactcatgca gaattcaacc    780
aaagcgcctc tcaagagatc aaatgttgag aaggtgacta acgtgcagat cctggtgttg    840
tttggcatcc tcttggtcat ggccttggtg agctcggcgg gggccctgta ctggaacagg    900
tctcatggtg aaaagaactg gtacatcaag aagatggaca ccacctcaga taattttgga    960
tacaacctac tgacgttcat catcttatac aacaatctta ttcccatcag tctgttggtg   1020
actcttgagg ttgtgaagta tactcaagcc cttttcataa actgggacac agatatgtat   1080
tatataggaa atgacactcc tgccatggcc aggacatcaa accttaatga gagcttggg    1140
caggtgaaat atctcttttc tgacaagact ggaacgctta catgcaatat catgaacttt   1200
aagaagtgca gcattgccgg agtaacctat ggtcacttcc cagaattggc aagagagccg   1260
tcttcagatg acttctgtcg gatgcctcct ccctgtagtg attcctgtga ctttgatgac   1320
cccaggctgt tgaagaacat tgaggatcgc catcccacag ccccttgcat tcaggagttc   1380
ctcacccttc tggccgtgtg ccacacggtt gttcctgaga aggatggaga taacatcatc   1440
taccaggcct cttcccccaga tgaagctgct ttggtgaaag gagctaaaaa gctgggcttt   1500
gtcttcacag ccagaacacc attctcagtc atcatagaag cgatgggaca ggaacaaaca   1560
tttggaatcc ttaatgtcct ggaatttct agtgacagaa aaagaatgtc tgtaattgtt   1620
cgaactcctt caggacgact tcggctttac tgtaaagggg ctgataatgt gattttgag    1680
agactttcaa aagactcaaa atatatggag gaaacattat gccatctgga atactttgcc   1740
acggaaggct tgcggactct ctgtgtggct tatgctgatc tctctgagaa tgagtatgag   1800
gagtggctga aagtctatca ggaagccagc accatattga aggacagagc tcaacggttg   1860
gaagagtgtt acgagatcat tgagaagaat ttgctgctac ttggagccac agccatagaa   1920
gatcgccttc aagcaggagt tccagaaacc atcgcaacac tgttgaaggc agaaattaaa   1980
atatgggtgt tgacaggaga caaacaagaa actgcgatta atataggta ttcctgccga   2040
ttggtatcgc agaatatggc ccttatccta ttgaaggagg actctttgga tgccacaagg   2100
gcagccatta ctcagcactg cactgacctt gggaatttgc tgggcaagga aaatgacgtg   2160
gccctcatca tcgatggcca caccctgaag tacgcgctct ccttcgaagt ccggaggagt   2220
ttcctggatt tggcactctc gtgcaaagcg gtcatatgct gcagagtgtc tcctctgcag   2280
aagtctgaga tagtggatgt ggtgaagaag cgggtgaagg ccatcaccct cgccatcgga   2340
gacggcgcca acgatgtcgg gatgatccag acagcccacg tgggtgtggg aatcagtggg   2400
aatgaaggca tgcaggccac caacaactcg gattacgcca tcgcacagtt ttcctactta   2460
gagaagcttc tgttggttca tggagcctgg agctacaacc gggtgaccaa gtgcatcttg   2520
tactgcttct ataagaacgt ggtcctgtat attattgagc tttggttcgc ctttgttaat   2580
ggattttctg gcagatttt atttgaacgt tggtgcatcg gcctgtacaa tgtgattttc   2640
accgctttgc cgcccttcac tctgggaatc tttgagaggt cttgcactca ggagagcatg   2700
ctcaggtttc cccagctcta caaaatcacc cagaatggcg aaggcttcaa cacaaaggtt   2760
ttctggggtc actgcatcaa cgccttggtc cactccctca tcctcttctg gttcccatg    2820
aaagctctgg agcatgatac tgtgttgaca agtggtcatg ctaccgacta tttatttgtt   2880
ggaaatattg tttacacata tgttgttgtt actgtttgtc tgaaagctgg tttggagacc   2940
acagcttgga ctaaattcag tcatctggct gtctgggaa gcatgctgac ctggctggtg   3000
ttttttggca tctactcgac catctggccc accattccca ttgctccaga tatgagagga   3060
caggcaacta tggtcctgag ctccgcacac ttctggttgg gattatttct ggttcctact   3120
gcctgtttga ttgaagatgt ggcatggaga gcagccaagc acacctgcaa aaagacattg   3180
ctggaggagg tgcaggagct ggaaaccaag tctcgagtcc tgggaaaagc ggtgctgcgg   3240
gatagcaatg gaaagaggct gaacgagcgc gaccgcctga tcaagaggct gggccggaag   3300
acgcccccga cgctgttccg gggcagctcc ctgcagcagg cgtcccgca tgggtatgct   3360
ttttctcaag aagaacacgg agctgttagt caggaagaag tcatccgtgc ttatgacacc   3420
accaaaaaga aatccaggaa gaaa                                          3444
```

<210> 63
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 63

25

cgcagaatat ggcccttatc c   21

<210> 64
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 64
cattttcctt gcccagcaaa   20

<210> 65
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

<400> 65
ccattactca gcactgcact gaccttgg   28

<210> 66
<211> 791
<212> PRT
<213> Human

<400> 66
Met Lys Ala His Pro Lys Glu Met Val Pro Leu Met Gly Lys Arg Val
                5   10   15
Ala Ala Pro Ser Gly Asn Pro Ala Val Leu Pro Glu Lys Arg Pro Ala
            20   25   30
Glu Ile Thr Pro Thr Lys Lys Ser Ala His Phe Phe Leu Glu Ile Glu
        35   40   45
Gly Phe Glu Pro Asn Pro Thr Val Ala Lys Thr Ser Pro Pro Val Phe
    50   55   60
Ser Lys Pro Met Asp Ser Asn Ile Arg Gln Cys Ile Ser Gly Asn Cys
65   70   75   80
Asp Asp Met Asp Ser Pro Gln Ser Pro Gln Asp Asp Val Thr Glu Thr
                85   90   95
Pro Ser Asn Pro Asn Ser Pro Ser Ala Gln Leu Ala Lys Glu Glu Gln
            100   105   110
Arg Arg Lys Lys Arg Arg Leu Lys Lys Arg Ile Phe Ala Ala Val Ser
        115   120   125
Glu Gly Cys Val Glu Glu Leu Val Glu Leu Leu Val Glu Leu Gln Glu
    130   135   140
Leu Cys Arg Arg Arg His Asp Glu Asp Val Pro Asp Phe Leu Met His
145   150   155   160
Lys Leu Thr Ala Ser Asp Thr Gly Lys Thr Cys Leu Met Lys Ala Leu
                165   170   175
Leu Asn Ile Asn Pro Asn Thr Lys Glu Ile Val Arg Ile Leu Leu Ala
            180   185   190
Phe Ala Glu Glu Asn Asp Ile Leu Gly Arg Phe Ile Asn Ala Glu Tyr
        195   200   205
Thr Glu Glu Ala Tyr Glu Gly Gln Thr Ala Leu Asn Ile Ala Ile Glu

26

```
            210                 215                 220
Arg Arg Gln Gly Asp Ile Ala Ala Leu Leu Ile Ala Ala Gly Ala Asp
225                 230                 235                 240
Val Asn Ala His Ala Lys Gly Ala Phe Phe Asn Pro Lys Tyr Gln His
                245                 250                 255
Glu Gly Phe Tyr Phe Gly Glu Thr Pro Leu Ala Leu Ala Ala Cys Thr
                260                 265                 270
Asn Gln Pro Glu Ile Val Gln Leu Leu Met Glu His Glu Gln Thr Asp
                275                 280                 285
Ile Thr Ser Arg Asp Ser Arg Gly Asn Asn Ile Leu His Ala Leu Val
                290                 295                 300
Thr Val Ala Glu Asp Phe Lys Thr Gln Asn Asp Phe Val Lys Arg Met
305                 310                 315                 320
Tyr Asp Met Ile Leu Leu Arg Ser Gly Asn Trp Glu Leu Glu Thr Thr
                325                 330                 335
Arg Asn Asn Asp Gly Leu Thr Pro Leu Gln Leu Ala Ala Lys Met Gly
                340                 345                 350
Lys Ala Glu Ile Leu Lys Tyr Ile Leu Ser Arg Glu Ile Lys Glu Lys
                355                 360                 365
Arg Leu Arg Ser Leu Ser Arg Lys Phe Thr Asp Trp Ala Tyr Gly Pro
                370                 375                 380
Val Ser Ser Ser Leu Tyr Asp Leu Thr Asn Val Asp Thr Thr Thr Asp
385                 390                 395                 400
Asn Ser Val Leu Glu Ile Thr Val Tyr Asn Thr Asn Ile Asp Asn Arg
                405                 410                 415
His Glu Met Leu Thr Leu Glu Pro Leu His Thr Leu Leu His Met Lys
                420                 425                 430
Trp Lys Lys Phe Ala Lys His Met Phe Phe Leu Ser Phe Cys Phe Tyr
                435                 440                 445
Phe Phe Tyr Asn Ile Thr Leu Thr Leu Val Ser Tyr Tyr Arg Pro Arg
                450                 455                 460
Glu Glu Glu Ala Ile Pro His Pro Leu Ala Leu Thr His Lys Met Gly
465                 470                 475                 480
Trp Leu Gln Leu Leu Gly Arg Met Phe Val Leu Ile Trp Ala Met Cys
                485                 490                 495
Ile Ser Val Lys Glu Gly Ile Ala Ile Phe Leu Leu Arg Pro Ser Asp
                500                 505                 510
Leu Gln Ser Ile Leu Ser Asp Ala Trp Phe His Phe Val Phe Phe Ile
                515                 520                 525
Gln Ala Val Leu Val Ile Leu Ser Val Phe Leu Tyr Leu Phe Ala Tyr
                530                 535                 540
Lys Glu Tyr Leu Ala Cys Leu Val Leu Ala Met Ala Leu Gly Trp Ala
545                 550                 555                 560
Asn Met Leu Tyr Tyr Thr Arg Gly Phe Gln Ser Met Gly Met Tyr Ser
                565                 570                 575
Val Met Ile Gln Lys Val Ile Leu His Asp Val Leu Lys Phe Leu Phe
                580                 585                 590
Val Tyr Ile Val Phe Leu Leu Gly Phe Gly Val Ala Leu Ala Ser Leu
                595                 600                 605
Ile Glu Lys Cys Pro Lys Asp Asn Lys Asp Cys Ser Ser Tyr Gly Ser
                610                 615                 620
Phe Ser Asp Ala Val Leu Glu Leu Phe Lys Leu Thr Ile Gly Leu Gly
625                 630                 635                 640
Asp Leu Asn Ile Gln Gln Asn Ser Lys Tyr Pro Ile Leu Phe Leu Phe
                645                 650                 655
Leu Leu Ile Thr Tyr Val Ile Leu Thr Phe Val Leu Leu Leu Asn Met
                660                 665                 670
```

27

```
Leu Ile Ala Leu Met Gly Glu Thr Val Glu Asn Val Ser Lys Glu Ser
        675             680             685
Glu Arg Ile Trp Arg Leu Gln Arg Ala Arg Thr Ile Leu Glu Phe Glu
        690             695             700
Lys Met Leu Pro Glu Trp Leu Arg Ser Arg Phe Arg Met Gly Glu Leu
705             710             715             720
Cys Lys Val Ala Glu Asp Asp Phe Arg Leu Cys Leu Arg Ile Asn Glu
            725             730             735
Val Lys Trp Thr Glu Trp Lys Thr His Val Ser Phe Leu Asn Glu Asp
            740             745             750
Pro Gly Pro Val Arg Arg Thr Ala Asp Phe Asn Lys Ile Gln Asp Ser
            755             760             765
Ser Arg Asn Asn Ser Lys Thr Thr Leu Asn Ala Phe Glu Glu Val Glu
        770             775             780
Glu Phe Pro Glu Thr Ser Val
785             790
```

<210> 67
<211> 2373
<212> DNA
<213> Human

<400> 67

```
atgaaagccc accccaagga gatggtgcct ctcatgggca agagagttgc tgcccccagt   60
gggaaccctg ccgtcctgcc agagaagagg ccggcggaga tcacccccac aaagaagagt  120
gcacacttct tcctggagat agaagggttt gaacccaacc ccacagttgc caagacctct  180
cctcctgtct tctccaagcc catggattcc aacatccggc agtgcatctc tggtaactgt  240
gatgacatgg actcccccca gtctcctcaa gatgatgtga cagagacccc atccaatccc  300
aacagcccca gtgcacagct ggccaaggaa gagcagagga ggaaaaagag gcggctgaag  360
aagcgcatct ttgcagccgt gtctgagggc tgcgtggagg agttggtaga gttgctggtg  420
gagctgcagg agctttgcag gcggcgccat gatgaggatg tgcctgactt cctcatgcac  480
aagctgacgg cctccgacac ggggaagacc tgcctgatga aggccttgtt aaacatcaac  540
cccaacacca aggagatcgt gcggatcctg cttgcctttg ctgaagagaa cgacatcctg  600
ggcaggttca tcaacgccga gtacacagag gaggcctatg aagggcagac ggcgctgaac  660
atcgccatcg agcggcggca gggggacatc gcagccctgc tcatcgccgc cggcgccgac  720
gtcaacgcgc acgccaaggg ggccttcttc aaccccaagt accaacacga aggcttctac  780
ttcggtgaga cgcccctggc cctggcagca tgcaccaacc agcccgagat tgtgcagctg  840
ctgatggagc acgagcagac ggacatcacc tcgcgggact cacgaggcaa caacatcctt  900
cacgccctgg tgaccgtggc cgaggacttc aagacgcaga tgactttgt gaagcgcatg  960
tacgacatga tcctactgcg gagtggcaac tgggagctgg agaccactcg caacaacgat 1020
ggcctcacgc cgctgcagct ggccgccaag atgggcaagg cggagatcct gaagtacatc 1080
ctcagtcgtg agatcaagga gaagcggctc cggagcctgt ccaggaagtt caccgactgg 1140
gcgtacggac ccgtgtcatc ctccctctac gacctcacca acgtggacac caccacggac 1200
aactcagtgc tggaaatcac tgtctacaac accaacatcg acaaccggca tgagatgctg 1260
accctggagc cgctgcacac gctgctgcat atgaagtgga gaagtttgc caagcacatg 1320
ttctttctgt ccttctgctt ttatttcttc tacaacatca ccctgaccct cgtctcgtac 1380
taccgccccc gggaggagga ggccatcccg cacccccttgg ccctgacgca aagatgggg 1440
tggctgcagc tcctagggag gatgtttgtg ctcatctggg ccatgtgcat ctctgtgaaa 1500
gagggcattg ccatcttcct gctgagaccc tcggatctgc agtccatcct ctcggatgcc 1560
tggttccact ttgtcttttt tatccaagct gtgcttgtga tactgtctgt cttcttgtac 1620
ttgtttgcct acaaagagta cctcgcctgc ctcgtgctgg ccatggccct gggctgggcg 1680
aacatgctct actatacgcg gggtttccag tccatgggca tgtacagcgt catgatccag 1740
aaggtcattt tgcatgatgt tctgaagttc ttgtttgtat atatcgtgtt tttgcttgga 1800
tttggagtag ccttggcctc gctgatcgag aagtgtccca agacaacaa ggactgcagc 1860
tcctacggca gcttcagcga cgcagtgctg gaactcttca gctcaccat aggcctgggt 1920
gacctgaaca tccagcagaa ctccaagtat cccattctct ttctgttcct gctcatcacc 1980
tatgtcatcc tcacctttgt tctcctcctc aacatgctca ttgctctgat gggcgagact 2040
```

```
gtggagaacg tctccaagga gagcgaacgc atctggcgcc tgcagagagc caggaccatc    2100
ttggagtttg agaaaatgtt accagaatgg ctgaggagca gattccggat gggagagctg    2160
tgcaaagtgg ccgaggatga tttccgactg tgtttgcgga tcaatgaggt gaagtggact    2220
gaatggaaga cgcacgtctc cttccttaac gaagacccgg ggcctgtaag acgaacagca    2280
gatttcaaca aaatccaaga ttcttccagg aacaacagca aaaccactct caatgcattt    2340
gaagaagtcg aggaattccc ggaaacctcg gtg                                  2373
```

<210> 68
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 68
```
ccatcctaat acgactcact atagggc                                             27
```

<210> 69
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 69
```
cgggggcggt agtacgagac gag                                                 23
```

<210> 70
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 70
```
actcactata gggctcgagc ggc                                                 23
```

<210> 71
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 71
```
cagcaaaggc aagcaggatc cgcactat                                            28
```

<210> 72
<211> 17
<212> DNA
<213> Artificial Sequence

<220>

<223> Primer

<400> 72
caggaaacag ctatgac   17

<210> 73
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 73
gtaaaacgac ggccag   16

<210> 74
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 74
gtgcactggg gctgttggga ttggatgg   28

<210> 75
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 75
atggctggtg aggttctggg tggtcgtg   28

<210> 76
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 76
tgaggaggag aacaaaggtg aggatgaca   29

<210> 77
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

```
<400> 77
actgcgtcgc tgaagctgcc gtaggag                                    27

<210> 78
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 78
tcccattctc tttctgttcc tgctcatca                                  29

<210> 79
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 79
tgtcatcctc acctttgttc tcctcctca                                  29

<210> 80
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 80
aacgaagacc cggggcctgt aagacgaa                                   28

<210> 81
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 81
ccgccgcctc agccacagtc c                                          21

<210> 82
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 82
gctctgggtt ccgcttctac ac                                         22
```

31

```
<210> 83
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 83
atgaaagccc accccaagga gatg                                              24

<210> 84
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 84
ctacaccgag gtttccggga attc                                              24

<210> 85
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 85
tggagcacga gcagacggac atca                                              24

<210> 86
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 86
gcggatcctg cttgcctttg ctgaa                                             25

<210> 87
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 87
cgcgggactc acgaggcaac aaca                                              24

<210> 88
```

<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 88
ggctgggcga acatgctcta ctat   24

<210> 89
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 89
cgctgctgca tatgaagtgg aagaagttt   29

<210> 90
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 90
cagacggaca tcacctcgcg ggactcacg   29

<210> 91
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 91
gagagctgtg caaagtggcc gaggatgat   29

<210> 92
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 92
gagtcccgcg aggtgatgtc cgtctgct   28

<210> 93
<211> 28
<212> DNA

34

```
acggcctccg acacggggaa gacctgcctg atgaaggcct tgttaaacat caaccccaac    660
accaaggaga tagtgcggat cctgcttgcc tttgctg                              697


<210> 98
<211> 275
<212> DNA
<213> Human

<400> 98
ttcttgagca gtgcgtcatg gttgtgtgag tttgtgtcaa acttgctgta ggtctgcttg     60
aggatctgcc cagtccggcg gctgccgtct tccagcctcc ccatcagcgt ttggatgcct    120
tcctctaggt cctttaggag gtgatagtca tcgctgtccc tgcaatgaga gcttcccgcc    180
gcctcagcca cagtcccacc cggggggcctt gggccccaga catgcggtga tctcagggca    240
agggttgcac gaccacccag aacctcacca gccat                               275


<210> 99
<211> 586
<212> DNA
<213> Human

<400> 99
agaagtttgc caagcacatg ttctttctgt ccttctgctt ttatttcttc tacaacatca     60
ccctgaccct cgtctcgtac taccgccccc gggaggagga ggccatcccg caccccttgg    120
ccctgacgca caagatgggg tggctgcagc tcctagggag gatgtttgtg ctcatctggg    180
ccatgtgcat ctctgtgaaa gagggcattg ccatcttcct gctgagaccc tcggatctgc    240
agtccatcct ctcggatgcc tggttccact ttgtcttttt tatccaagct gtgcttgtga    300
tactgtctgt cttcttgtac ttgtttgcct acaaagagta cctcgcctgc ctcgtgctgg    360
ccatggccct gggctgggcg aacatgctct actatacgcg gggtttccag tccatgggca    420
tgtacagcgt catgatccag aaggtcattt tgcatgatgt tctgaagttc ttgtttgtat    480
atatcgtgtt tttgcttgga tttggagtag ccttggcctc gctgatcgag aagtgtccca    540
aagacaacaa ggactgcagc tcctacggca gcttcagcga cgcagt                   586


<210> 100
<211> 307
<212> DNA
<213> Human

<400> 100
tgtcatcctc acctttgttc tcctcctcaa catgctcatt gctctgatgg gcgagactgt     60
ggagaacgtc tccaaggaga gcgaacgcat ctggcgcctg cagagagcca ggaccatctt    120
ggagtttgag aaaatgttac cagaatggct gaggagcaga ttccggatgg gagagctgtg    180
caaagtggcc gaggatgatt tccgactgtg tttgcggatc aatgaggtga agtggactga    240
atggaagacg cacgtctcct tccttaacga agacccgggg cctgtaagac gaacagcaga    300
tttcaac                                                              307


<210> 101
<211> 156
<212> DNA
<213> Human

<400> 101
aacgaagacc cggggcctgt aagacgaaca gcagatttca acaaaatcca agattcttcc     60
aggaacaaca gcaaaaccac tctcaatgca tttgaagaag tcgaggaatt cccggaaacc    120
tcggtgtaga agcggaaccc agagctggtg tgcgcg                              156


<210> 102
```

35

<211> 2376
<212> DNA
<213> Human

<400> 102
atgaaagccc accccaagga gatggtgcct ctcatgggca agagagttgc tgcccccagt   60
gggaaccctg ccgtcctgcc agagaagagg ccggcggaga tcacccccac aaagaagagt   120
gcacacttct tcctggagat agaagggttt gaacccaacc ccacagttgc caagacctct   180
cctcctgtct tctccaagcc catggattcc aacatccggc agtgcatctc tggtaactgt   240
gatgacatgg actccccccca gtctcctcaa gatgatgtga cagagacccc atccaatccc   300
aacagcccca gtgcacagct ggccaaggaa gagcagagga ggaaaaagag gcggctgaag   360
aagcgcatct ttgcagccgt gtctgagggc tgcgtggagg agttggtaga gttgctggtg   420
gagctgcagg agctttgcag gcggcgccat gatgaggatg tgcctgactt cctcatgcac   480
aagctgacgg cctccgacac ggggaagacc tgcctgatga aggccttgtt aaacatcaac   540
cccaacacca aggagatcgt gcggatcctg cttgcctttg ctgaagagaa cgacatcctg   600
ggcaggttca tcaacgccga gtacacagag gaggcctatg aagggcagac ggcgctgaac   660
atcgccatcg agcggcggca gggggacatc gcagccctgc tcatcgccgc cggcgccgac   720
gtcaacgcgc acgccaaggg ggccttcttc aaccccaagt accaacacga aggcttctac   780
ttcggtgaga cgccccctggc cctggcagca tgcaccaacc agcccgagat tgtgcagctg   840
ctgatggagc acgagcagac ggacatcacc tcgcgggact cacgaggcaa caacatcctt   900
cacgccctgg tgaccgtggc cgaggacttc aagacgcaga atgactttgt gaagcgcatg   960
tacgacatga tcctactgcg gagtggcaac tgggagctgg agaccactcg caacaacgat   1020
ggcctcacgc cgctgcagct ggccgccaag atgggcaagg cggagatcct gaagtacatc   1080
ctcagtcgtg agatcaagga gaagcggctc cggagcctgt ccaggaagtt caccgactgg   1140
gcgtacggac ccgtgtcatc ctccctctac gacctcacca acgtggacac caccacggac   1200
aactcagtgc tggaaatcac tgtctacaac accaacatcg acaaccggca tgagatgctg   1260
accctggagc cgctgcacac gctgctgcat atgaagtgga gaagtttgc caagcacatg   1320
ttctttctgt ccttctgctt ttatttcttc tacaacatca ccctgaccct cgtctcgtac   1380
taccgccccc gggaggagga ggccatcccg cacccctcgg ccctgacgca aagatgggg   1440
tggctgcagc tcctagggag gatgtttgtg ctcatctggg ccatgtgcat ctctgtgaaa   1500
gagggcattg ccatcttcct gctgagaccc tcggatctgc agtccatcct ctcggatgcc   1560
tggttccact ttgtcttttt tatccaagct gtgcttgtga tactgtctgt cttcttgtac   1620
ttgtttgcct acaaagagta cctcgcctgc ctcgtgctgg ccatggccct gggctgggcg   1680
aacatgctct actatacgcg gggtttccag tccatgggca tgtacagcgt catgatccag   1740
aaggtcattt tgcatgatgt tctgaagttc ttgtttgtat atatcgtgtt tttgcttgga   1800
tttggagtag ccttggcctc gctgatcgag aagtgtccca agacaacaa ggactgcagc   1860
tcctacggca gcttcagcga cgcagtgctg gaactcttca gctcaccat aggcctgggt   1920
gacctgaaca tccagcagaa ctccaagtat cccattctct ttctgttcct gctcatcacc   1980
tatgtcatcc tcaccttgt tctcctcctc aacatgctca ttgctctgat gggcgagact   2040
gtggagaacg tctccaagga gagcgaacgc atctggcgcc tgcagagagc caggaccatc   2100
ttggagtttg agaaaatgtt accagaatgg ctgaggagca gattccggat gggagagctg   2160
tgcaaagtgg ccgaggatga ttttccgact gtgtttgcgga tcaatgaggt gaagtggact   2220
gaatggaaga cgcacgtctc cttccttaac gaagacccgg ggcctgtaag acgaacagca   2280
gatttcaaca aaatccaaga ttcttccagg aacaacagca aaaccactct caatgcattt   2340
gaagaagtcg aggaattccc ggaaacctcg gtgtag   2376

<210> 103
<211> 2373
<212> DNA
<213> Human

<400> 103
atgaaagccc accccaagga gatggtgcct ctcatgggca agagagttgc tgcccccagt   60
gggaaccctg ccgtcctgcc agagaagagg ccggcggaga tcaccccccac aaagaagagt   120
gcacacttct tcctggagat agaagggttt gaacccaacc ccacagttgc caagacctct   180
cctcctgtct tctccaagcc catggattcc aacatccggc agtgcatctc tggtaactgt   240
gatgacatgg actccccccca gtctcctcaa gatgatgtga cagagacccc atccaatccc   300

36

```
aacagcccca gtgcacagct ggccaaggaa gagcagagga ggaaaaagag gcggctgaag    360
aagcgcatct ttgcagccgt gtctgagggc tgcgtggagg agttggtaga gttgctggtg    420
gagctgcagg agctttgcag gcggcgccat gatgaggatg tgcctgactt cctcatgcac    480
aagctgacgg cctccgacac ggggaagacc tgcctgatga aggccttgtt aaacatcaac    540
cccaacacca aggagatagt gcggatcctg cttgcctttg ctgaagagaa cgacatcctg    600
ggcaggttca tcaacgccga gtacacagag gaggcctatg aagggcagac ggcgctgaac    660
atcgccatcg agcggcggca gggggacatc gcagccctgc tcatcgccgc cggcgccgac    720
gtcaacgcgc acgccaaggg ggccttcttc aaccccaagt accaacacga aggcttctac    780
ttcggtgaga cgcccctggc cctggcagca tgcaccaacc agcccgagat tgtgcagctg    840
ctgatggagc acgagcagac ggacatcacc tcgcgggact cacgaggcaa caacatcctt    900
cacgccctgg tgaccgtggc cgaggacttc aagacgcaga tgactttgt gaagcgcatg    960
tacgacatga tcctactgcg gagtggcaac tgggagctgg agaccactcg caacaacgat   1020
ggcctcacgc cgctgcagct ggccgccaag atgggcaagg cggagatcct gaagtacatc   1080
ctcagtcgtg agatcaagga gaagcggctc cggagcctgt ccaggaagtt caccgactgg   1140
gcgtacggac ccgtgtcatc ctccctctac gacctcacca acgtggacac caccacggac   1200
aactcagtgc tggaaatcac tgtctacaac accaacatcg acaaccggca tgagatgctg   1260
accctggagc cgctgcacac gctgctgcat atgaagtgga gaagtttgc caagcacatg   1320
ttctttctgt ccttctgctt ttatttcttc tacaacatca ccctgaccct cgtctcgtac   1380
taccgccccc gggaggagga ggccatcccg cacccttgg ccctgacgca caagatgggg   1440
tggctgcagc tcctagggag gatgtttgtg ctcatctggg ccatgtgcat ctctgtgaaa   1500
gagggcattg ccatcttcct gctgagaccc tcggatctgc agtccatcct ctcggatgcc   1560
tggttccact ttgtcttttt tatccaagct gtgcttgtga tactgtctgt cttcttgtac   1620
ttgtttgcct acaaagagta cctcgcctgc tcgtgctgg ccatggccct gggctgggcg   1680
aacatgctct actatacgcg gggtttccag tccatgggca tgtacagcgt catgatccag   1740
aaggtcattt tgcatgatgt tctgaagttc ttgtttgtat atatcgtgtt tttgcttgga   1800
tttggagtag ccttggcctc gctgatcgag aagtgtccca agacaacaa ggactgcagc   1860
tcctacggca gcttcagcga cgcagtgctg gaactcttca agctcaccat aggcctgggt   1920
gacctgaaca tccagcagaa ctccaagtat cccattctct ttctgttcct gctcatcacc   1980
tatgtcatcc tcacctttgt tctcctcctc aacatgctca ttgctctgat gggcgagact   2040
gtggagaacg tctccaagga gagcgaacgc atctggcgcc tgcagagagc caggaccatc   2100
ttggagtttg agaaaatgtt accagaatgg ctgaggagca gattccggat gggagagctg   2160
tgcaaagtgg ccgaggatga tttccgactg tgtttgcgga tcaatgaggt gaagtggact   2220
gaatggaaga cgcacgtctc cttccttaac gaagacccgg ggcctgtaag acgaacagca   2280
gatttcaaca aaatccaaga ttcttccagg aacaacagca aaaccactct caatgcattt   2340
gaagaagtcg aggaattccc ggaaacctcg gtg                                 2373
```

<210> 104
<211> 373
<212> PRT
<213> Mouse

<400> 104

```
Met Ser Thr Asp Cys Ala Gly Asn Ser Thr Cys Pro Val Asn Ser Thr
                5                  10                  15
Glu Glu Asp Pro Pro Val Gly Met Glu Gly His Ala Asn Leu Lys Leu
            20                  25                  30
Leu Phe Thr Val Leu Ser Ala Val Met Val Gly Leu Val Met Phe Ser
        35                  40                  45
Phe Gly Cys Ser Val Glu Ser Gln Lys Leu Trp Leu His Leu Arg Arg
    50                  55                  60
Pro Trp Gly Ile Ala Val Gly Leu Leu Ser Gln Phe Gly Leu Met Pro
65                  70                  75                  80
Leu Thr Ala Tyr Leu Leu Ala Ile Gly Phe Gly Leu Lys Pro Phe Gln
                85                  90                  95
Ala Ile Ala Val Leu Met Met Gly Ser Cys Pro Gly Gly Thr Ile Ser
            100                 105                 110
Asn Val Leu Thr Phe Trp Val Asp Gly Asp Met Asp Leu Ser Ile Ser
```

37

```
          115                   120                   125
Met Thr Thr Cys Ser Thr Val Ala Ala Leu Gly Met Met Pro Leu Cys
    130                   135                   140
Leu Tyr Ile Tyr Thr Arg Ser Trp Thr Leu Thr Gln Asn Leu Val Ile
145                   150                   155                   160
Pro Tyr Gln Ser Ile Gly Ile Thr Leu Val Ser Leu Val Val Pro Val
                165                   170                   175
Ala Ser Gly Val Tyr Val Asn Tyr Arg Trp Pro Lys Gln Ala Thr Val
                180                   185                   190
Ile Leu Lys Val Gly Ala Ile Leu Gly Gly Met Leu Leu Leu Val Val
                195                   200                   205
Ala Val Thr Gly Met Val Leu Ala Lys Gly Trp Asn Thr Asp Val Thr
    210                   215                   220
Leu Leu Val Ile Ser Cys Ile Phe Pro Leu Val Gly His Val Thr Gly
225                   230                   235                   240
Phe Leu Leu Ala Phe Leu Thr His Gln Ser Trp Gln Arg Cys Arg Thr
                245                   250                   255
Ile Ser Ile Glu Thr Gly Ala Gln Asn Ile Gln Leu Cys Ile Ala Met
                260                   265                   270
Leu Gln Leu Ser Phe Ser Ala Glu Tyr Leu Val Gln Leu Leu Asn Phe
                275                   280                   285
Ala Leu Ala Tyr Gly Leu Phe Gln Val Leu His Gly Leu Leu Ile Val
    290                   295                   300
Ala Ala Tyr Gln Ala Tyr Lys Arg Arg Gln Lys Ser Lys Cys Arg Arg
305                   310                   315                   320
Gln His Pro Asp Cys Pro Asp Val Cys Tyr Glu Lys Gln Pro Arg Glu
                325                   330                   335
Thr Ser Ala Phe Leu Asp Lys Gly Asp Glu Ala Ala Val Thr Leu Gly
                340                   345                   350
Pro Val Gln Pro Glu Gln His His Arg Ala Ala Glu Leu Thr Ser His
    355                   360                   365
Ile Pro Ser Cys Glu
    370


<210> 105
<211> 1119
<212> DNA
<213> Mouse


<400> 105
atgagcacag actgtgcggg caactccacc tgccctgtca acagtacgga ggaagacccg     60
cccgtgggaa tggagggcca tgcgaatcta aagctgcttt ttacagtgct ctcggctgtg    120
atggtggggtt tggtcatgtt ctcttttgga tgttctgtgg agagtcagaa gctctggttg    180
cacctcagaa gaccctgggg catcgcagtg ggcctgcttt cccagtttgg acttatgcct    240
ctgacagctt atctgttagc cattggcttc ggtctgaaac cattccaagc tattgctgtc    300
ctcatgatgg ggagctgccc tgggggcacc atctctaatg ttctcacctt ctgggttgat    360
ggagatatgg atctcagcat cagtatgaca acctgttcca cagtggccgc cctgggaatg    420
atgcctctct gcctctacat ctacacccgg tcctggactc tgacacagaa cctcgtcatt    480
ccgtatcaga gcataggaat taccccttgtg tccctggtgg ttcctgtggc ttctggcgtc    540
tatgtgaatt ataggtggcc aaagcaagca acggtcattc tcaaggtcgg agccattctg    600
ggtggcatgc tcctcctggt ggtggcagtt actggcatgg tcctggcaaa aggctggaac    660
acagacgtca ctcttctggt catcagctgc attttccccct tggtcggcca tgtcacaggc    720
ttcctgctgg cattcctcac ccaccaatct tggcaaaggt gcaggaccat ttccatagag    780
actggcgctc agaacatcca gctgtgcatc gccatgctgc agctgtcctt ctctgctgag    840
tacctggtcc agctgctaaa ctttgcattg cctatggac tcttccaagt gctgcacggg    900
ctgctcattg tcgcagcata tcaggcatac aagaggaggc agaagagtaa atgcaggaga    960
cagcacccgg attgcccaga cgtctgctac gagaagcagc cagagagac cagtgctttc   1020
```

38

```
ttggataaag gggatgaggc tgccgtaact ctggggccag tgcagccaga gcagcaccac   1080
agggctgctg agctgactag ccacattcct tcatgtgaa                          1119
```

<210> 106
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 106
```
gacctgccca gtgcttgcta ctca                                            24
```

<210> 107
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 107
```
tcttcactgg ccacggagga ggat                                            24
```

<210> 108
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 108
```
ctattgctgt cctcatgatg g                                               21
```

<210> 109
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 109
```
catgctgcag ctgtccttct c                                               21
```

<210> 110
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 110
```
ccatcatgag gacagcaata g                                               21
```

<210> 111
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 111
gagaaggaca gctgcagcat g   21

<210> 112
<211> 1237
<212> DNA
<213> Mouse

<400> 112
gacctgccca gtgcttgcta ctcatgttcc tttgtgttcc tgtgttctaa ttcatgagag   60
gagatgagca cagactgtgc gggcaactcc acctgccctg tcaacagtac ggaggaagac   120
ccgcccgtgg gaatggaggg ccatgcgaat ctaaagctgc tttttacagt gctctcggct   180
gtgatggtgg gtttggtcat gttctctttt ggatgttctg tggagagtca gaagctctgg   240
ttgcacctca gaagaccctg gggcatcgca gtgggcctgc tttcccagtt tggacttatg   300
cctctgacag cttatctgtt agccattggc ttcggtctga aaccattcca agctattgct   360
gtcctcatga tggggagctg ccctgggggc accatctcta atgttctcac cttctgggtt   420
gatggagata tggatctcag catcagtatg acaacctgtt ccacagtggc cgccctggga   480
atgatgcctc tctgcctcta catctacacc cggtcctgga ctctgacaca gaacctcgtc   540
attccgtatc agagcatagg aattaccctt gtgtccctgg tggttcctgt ggcttctggc   600
gtctatgtga attataggtg gccaaagcaa gcaacggtca ttctcaaggt cggagccatt   660
ctgggtggca tgctcctcct ggtggtggca gttactggca tggtcctggc aaaaggctgg   720
aacacagacg tcactcttct ggtcatcagc tgcattttcc ccttggtcgg ccatgtcaca   780
ggcttcctgc tggcattcct cacccaccaa tcttggcaaa ggtgcaggac catttccata   840
gagactggcg ctcagaacat ccagctgtgc atcgccatgc tgcagctgtc cttctctgct   900
gagtacctgg tccagctgct aaactttgca ttggcctatg gactcttcca agtgctgcac   960
gggctgctca ttgtcgcagc atatcaggca tacaagagga ggcagaagag taaatgcagg   1020
agacagcacc cggattgccc agacgtctgc tacgagaagc agcccagaga gaccagtgct   1080
ttcttggata aaggggatga ggctgccgta actctggggc cagtgcagcc agagcagcac   1140
cacagggctg ctgagctgac tagccacatt ccttcatgtg aatagtggga ggcacggacc   1200
agcttggccc tccatcctcc tccgtggcca gtgaaga   1237

<210> 113
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 113
cttctggcgt ctatgtgaat tatagg   26

<210> 114
<211> 19
<212> DNA
<213> Artificial Sequence

<220>

40

<223> Primer

<400> 114
gagcatgcca cccagaatg   19

<210> 115
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

<400> 115
caaagcaagc aacggtcatt ctcaaggtc   29

<210> 116
<211> 1046
<212> DNA
<213> Rat

<220>
<221> misc_feature
<222> (811)..(812)

<223> a, c, g or t

<400> 116
gaagacccac ccgtgggaat ggagggacag gggagcctga agcttgtttt cacagtcctg   60
tcggctgtga tggtgggtct ggtcatgttc tcctttggat gttcagtgga gagtcggaag   120
ctctggctgc acctcagaag accctggggc atcgcagtgg gcctgctttg ccagtttggg   180
ctcatgcctc tgacagctta tctgctagcc attggcttcg gtctgaaacc attccaagct   240
attgccgtcc tcatcatggg gagctgccct gggggcaccg tctctaatgt cctcaccttc   300
tgggttgatg gagatatgga cctcagcatc agcatgacga cctgctccac agtggctgct   360
ctgggaatga tgcccctctg cctctacgtc tacacccggt cctggactct tccacagagc   420
ctcaccatcc cgtaccagag cataggaatt acccttgtgt ccctggttgt tcctgtggcc   480
tccggcatct atgtgaatta taggtggcca aagcaagcaa cattcattct caaggtcggg   540
gctgctgttg gcggcatgct cctcctggtg gtggcagtta ccggcgtggt cctggcaaag   600
ggctggaaca tagatgtcac tcttctggtc atcagctgta tttttccctt ggtcggccat   660
gtcatgggct tcctgctggc gttcctcacc caccagtctt ggcaaaggtg caggacgatt   720
tccatagaga ccggagcaca gaacatccag ctgtgcattg ccatgatgca gctgtccttc   780
tctgctgagt acctggtcca gctgttaaac nncgccctgg cctacggact cttccaagtg   840
ctgcacgggc tgctcattgt cgcagcatat caggcataca agaggaggca gaagagtcaa   900
tacaggagac agcacccgga gtgccaagac atcagctctg agaagcagcc cagagagacc   960
agtgccttct tggataaagg ggctgaggct gctgtaactc tggggctaga gcagcaccac   1020
aggaccgctg aactgaccag tcacgt   1046

<210> 117
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 117

```
atgagcgcag actgcgaggg caa                                    23

<210> 118
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 118
tcccactatt cacatgaagg aacg                                   24

<210> 119
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 119
tccggcatct atgtgaatta tagg                                   24

<210> 120
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 120
taactgccac caccaggagg                                        20

<210> 121
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

<400> 121
agcaagcaac attcattctc aaggtcgg                               28

<210> 122
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 122
taggaagctt gtcgacatga gagccaattg ttccag                      36
```

```
<210> 123
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 123
aatgtctaga actagtctat tcacatgaag tgatgtgg                              38

<210> 124
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 124
tagaaggcac agtcgagg                                                    18

<210> 125
<211> 317
<212> DNA
<213> Mouse

<400> 125
ccggaggaac ctgccaaaat caagcatcgt ttctttgtat aagaagctgg agatgaaaca      60
ggccattgag atggtagaga ctgggatact gagctctgtg gcttctccca caccctatca     120
gtctgagagg atacagggaa tcaagcggct ttctcctgaa gacgtggagt ccatgcggga     180
cattctgaca agaagcatgt accaagttcg acaaagaacc ctatcctaca caaatacaa      240
cctcaaaccc caaacaagtg agaagcaagc caaagagatt ctgatccgtc gccagaacac     300
cttgagggag agcatgc                                                    317

<210> 126
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 126
ccggaggaac ctgccaaaat caa                                              23

<210> 127
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 127
gcatgctctc cctcaaggtg ttctgg                                          26
```

```
<210> 128
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 128
gatgaaacag gccattgaga tg                                                22

<210> 129
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 129
gattccctgt atcctctcag actga                                             25

<210> 130
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

<400> 130
ctgggatact gagctctgtg gctt                                              24

<210> 131
<211> 363
<212> DNA
<213> Rat

<400> 131
tcgtgggatg cggggggagta tttttcggca tcatttttgg attcatttcc gcatttatca     60
cacgtttcac tcagaacatc tctgcgatcg agcctctcat cgtcttcatg ttcagctatc     120
tgtcttactt agcagccgag acgctttatc tctccggaat cctggccatc acagcttgtg     180
cagtgacaat gaaaaagtac gtggaagaga cgtgtcccca gacgtcgtac acgaccatca     240
agtacttcat gaagatgctg agcagcgtga gcgagaccct catcttcatc ttcatgggcg     300
tgtccaccgt tgggaagaac catgagtgga actgggcttt cgtctgcttc accctggcct     360
tct                                                                   363

<210> 132
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 132
tcgtgggatg cggggggagta ttt                                             23
```

```
<210> 133
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 133
agaaggccag ggtgaagcag acga                                              24

<210> 134
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 134
agcagccgag acgctttatc t                                                 21

<210> 135
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 135
tctcttccac gtactttttc attgtc                                            26

<210> 136
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 136
aatcctggcc atcacagctt gtgca                                             25

<210> 137
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 137
gacaagctta tcgatatggc tctgcagatg ttcgt                                  35

<210> 138
```

<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 138
gactctagaa ctagtctatt tttttggag caaaggact   39

<210> 139
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 139
ctcctgccac ccatcgttct   20

<210> 140
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 140
gctggatgtg cccgattcat   20

<210> 141
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 141
catcagcgta tttgctctct   20

<210> 142
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 142
tccccaaaga tcatcatgta   20

<210> 143
<211> 680
<212> DNA

46

<213> Mouse

<400> 143
tccacggagc ctggagctac aaccgggtga ccaagtgtat cctgtactgt ttctacaaga   60
atgtggtcct ctacatcatc gagctatggt tcgcctttgt gaatggattt tctgggcaga   120
ttttattcga gcgctggtgc atcggcttgt acaatgtgat cttcacggca ttgccgccct   180
tcactctggg gatcttcgag aggtcttgta ctcaggagag catgctcagg ttcccacagc   240
tttacagaat cactcagaac gctgaaggtt tcaacactaa ggttttctgg ggtcactgca   300
tcaatgcctt ggttcattcc ctcatcctct tctgggttcc catgaaagcg ctggagcatg   360
atactccagt aaccagcggt catgccacag actatttgtt tgttggaaat attgtttaca   420
cgtacgttgt ggttacagtt tgtttgaaag ctggtttgga gacgacagct tggacgaaat   480
tcagtcacct ggcggtgtgg ggaagcatgc tgatctggtt ggtgttcttt ggtgtctatt   540
caaccatctg ccgaccatc cccattgctc ctgacatgaa agggcaggca actatggtcc   600
tgagctctgc gtacttctgg ttgggattgt tcctggttcc gactgcgtgt ttgattgaag   660
acgtggcgtg gagagcggcc   680

<210> 144
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 144
gccatcgcac agttttccta cct   23

<210> 145
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 145
catcctcttt ccgttactgt ctcg   24

<210> 146
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 146
aaccatctgg ccgaccatc   19

<210> 147
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

```
<400> 147
acgcagagct caggaccata g                                                    21


<210> 148
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 148
tgcctgccct ttcatgtcag gagc                                                 24


<210> 149
<211> 771
<212> DNA
<213> Rat

<400> 149
gctgcttttg gtccatggag cctggagcta caaccgggtg accaagtgca tcctctactg      60
tttctataag aatgtggtcc tctacatcat tgagctttgg ttcgcctttg ttaatggatt     120
ttctgggcag attttatttg agcgctggtg catcggcttg tacaatgtga tcttcacagc     180
attgccaccc ttcactctgg ggatcttcga gaggtcgtgt actcaggaga gcatgctcag     240
gtttccacag ctctacaaaa tcactcagaa cgccgaaggt ttcaacacga aggttttctg     300
gggtcactgc atcaatgcct tggtccactc cctcatcctc ttctgggttc caatgaaagc     360
gctggagcac gatactccgc taaccagtgg tcacgccaca gactatttgt ttgttggaaa     420
tattgtttac acgtacgttg tggtcacagt ttgtttgaaa gctggtttgg agacgacagc     480
ttggactaaa ttcagtcacc tggcagtgtg gggaagcatg ctgatctggt tggtgttctt     540
tggtgtctat tcaaccttct ggccgaccat ccccatcgct cctgacatga aagggcaggc     600
aactatggtc ctgagttctg cccacttctg gttgggtttg ctcctggttc ccactgcgtg     660
tttgatcgag gatgtggcgt ggagagcggc caaacacacc tgcaaaaaga cactgtctgg     720
aggaggttca ggagctggag accaagtccc gagtgtatgg gcaaagcgat g              771


<210> 150
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 150
tattcaacct tctggccgac c                                                    21


<210> 151
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 151
accagaagtg ggcagaactc a                                                    21


<210> 152
```

<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 152
catagttgcc tgccctttca tgtcagga   28

<210> 153
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 153
ttggatccgt cgacatgtcc cgggccacgt ctgttgg   37

<210> 154
<211> 43
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 154
ccgcggccgc actagtttat ttcttcctgg atttcttttt ggt   43

<210> 155
<211> 1064
<212> DNA
<213> Mouse

<400> 155
acagcctgag attgtgcagc tgctgatgga gaatgagcag acagacatcg cttcccagga   60
ttcccgggga aacaacatcc tgcacgcgct ggtgacggtg gctgaggact tcaagactca   120
gaatgacttc gttaagcgca tgtatgacat gatcctgctg aggagtggca actgggagct   180
ggagaccatg cgcaacaacg atgggctcac gccactgcag ctggctgcca agatgggcaa   240
ggctgagatc ctgaagtaca tcctcagccg cgagatcaag gagaagcctc tccggagctt   300
gtccaggaag ttcacggact gggcgtatgg gcctgtgtca tcctcactct atgacctcac   360
caatgtagac acaacgacgg ataactctgt gctggaaatc atcgtctaca acaccaacat   420
tgataaccga catgagatgc tgaccctgga gcctctgcat acgctgctac acacgaaatg   480
gaagaaattt gccaagtaca tgttcttctt gtccttctgc ttctatttct ctacaacat   540
caccctgacc cttgtctctt actaccgtcc tcgggaagat gaggatctcc cacaccccctt   600
ggccctgaca cacaaaatga gttggcttca gctcctaggg aggatgtttg tcctcatctg   660
ggccacatgc atctctgtga agaaggcat tgccattttc ctgctgagac cctccgatct   720
tcagtccatc ctgtcagatg cctggtttca ctttgtcttt tttgtccaag ctgtacttgt   780
gatactgtct gtattcttgt acttgtttgc ctacaaagaa tacctcgcct gcctcgtgct   840
ggccatggcc ctgggctggg cgaacatgct ctactacacg agaggcttcc agtctatggg   900
catgtacagc gtcatgatcc agaaggtcat tttgcatgat gtcctcaagt cttgtttgt   960
ttacatcctg ttcttacttg gatttggagt agcgctggcc tcactgattg agaagtgctc   1020
caaggacaaa aaggactgca gttcctatgg cagcttcagc gaca   1064

```
<210> 156
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 156
gcgtgtacta accagcctga gattgtg                                    27

<210> 157
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 157
gtcgctgaag ctgccatagg aactg                                      25

<210> 158
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 158
ctgagaccct ccgatcttca gt                                         22

<210> 159
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 159
ggcaggcgag gtattctttg ta                                         22

<210> 160
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Probe

<400> 160
cctgtcagat gcctggtttc actttgtctt                                 30

<210> 161
<211> 34
```

```
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 161
cggggtaccg tcgacatgaa agcccacccc aagg                              34

<210> 162
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 162
atttgcggcc gcactagtct acaccgaggt ttccggg                          37


<210> 163
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 163
taatacgact cactataggg                                             20

<210> 164
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 164
gacacgggga agacctgcct gatg                                        24

<210> 165
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 165
gtggcaactg ggagctggag acc                                         23

<210> 166
<211> 24
<212> DNA
```

<213> Artificial Sequence

<220>
<223> Primer

<400> 166
gggccatgtg catctctgtg aaag   24

<210> 167
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 167
ctgatgggcg agactgtgga g   21

<210> 168
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 168
tagaaggcac agtcgagg   18

<210> 169
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 169
ctccacagtc tcgcccatca g   21

<210> 170
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 170
ctttcacaga gatgcacatg gccc   24

<210> 171
<211> 23
<212> DNA
<213> Artificial Sequence

52

```
<220>
<223> Primer

<400> 171
ggtctccagc tcccagttgc cac                                    23

<210> 172
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 172
catcaggcag gtcttccccg tgtc                                   24
```